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THE
HORSEMAN'S
HANDBOOK



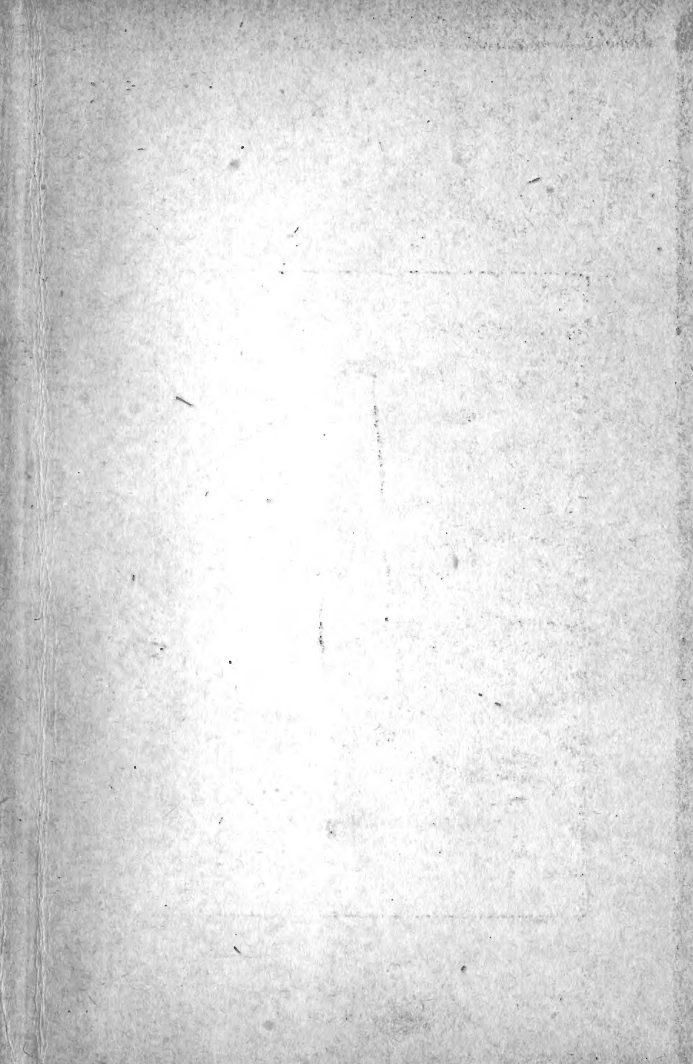
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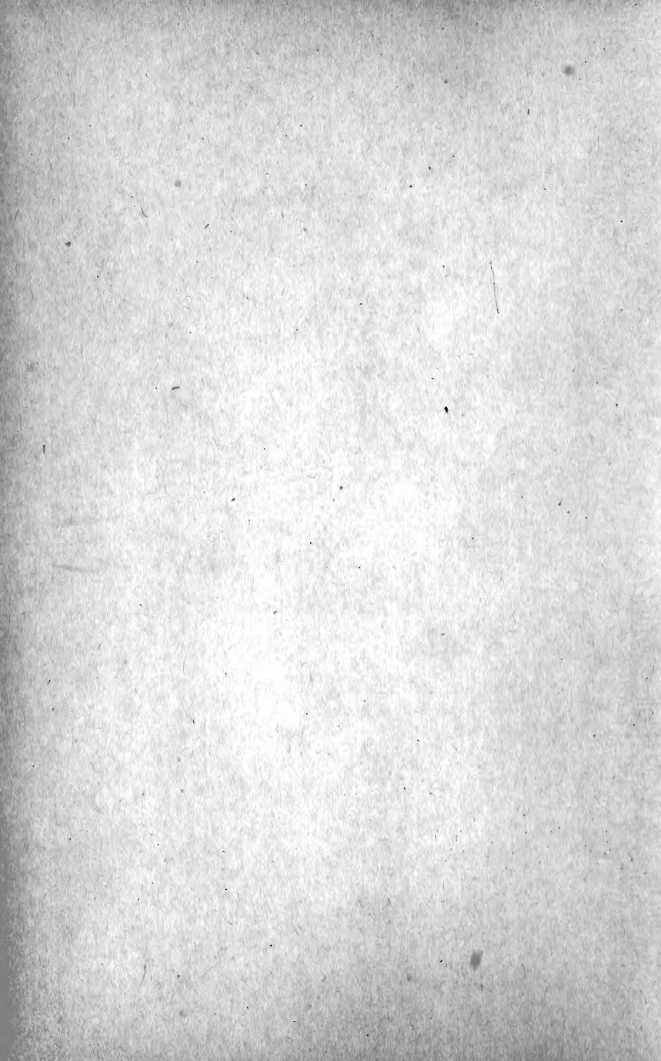
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THE

HORSEMAN'S HANDBOOK

**A Compendium of Useful Information
for Every Horse Owner**

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MAGNUS FLAWS & CO.

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PREFACE

This little volume was prepared for the purpose of supplying in brief form, practical information sought for by horsemen each day. Several chapters were prize essays selected by The Horse Review from hundreds of the writers on the subjects all over the country.

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CHAPTER I.

CARE AND MANAGEMENT OF STALLIONS.

As this chapter does not treat of the breaking and handling of colts, we will suppose you have a stallion broken to lead and drive, and that your purpose is to use him in the stud and on the track. Also, we will presume that the reader is somewhat familiar with the management of horses. Two things are absolutely necessary on the start, viz., a box stall and a paddock; but the details of these a little later. The first thing to learn about a *horse*, is that he is half horse and half human. The first thing to learn about a stallion, is that, in addition to above, he is part tiger! There is an element of treachery, of bold wanton cruelty and murderous destructiveness, found in the stallion, that obtains but slightly, if at all, in the average mare or gelding. It is no argument against the above declaration, that some stallions never seem to display much, if any, of the tigerish disposition. My own observation, and the testimony of many men who have had an extended experience with stallions, has convinced me that all stallions have these characteristics a little and some have an abundance of them. It is, therefore, highly essential that, in undertaking the care and management of a stallion, this knowledge should be in the possession of the groom. Never relax your watchfulness when about a stallion; treat him with the utmost kindness and consideration, but maintain a firmness quite unmistakable, and conduct yourself, always, in such a manner that he shall have the most unlimited confidence in you, and at the same time a wholesome respect for your powers and personality. Never play with a stallion in the least, for it brings you down

on a level with him, in his estimation; the familiarity will breed contempt, and you will lose part of your influence and control over him.

THE BOX STALL.

Have your box stall sixteen feet square, with one door four feet wide and eight feet high; made of double layers of flooring thoroughly riveted and hung on at least three strong hinges. Let there be one window, a single half sash containing four 12x14 lights of glass. Set the window in the same side wall as the door, so that there shall be no draught or chill air to cause stiffness and congestions. Elevate the window just high enough so that the horse will have to stand gracefully high-headed to look out of it. This will develop the muscles used in holding the head up, and aid in giving him that nice up-headed carriage of the head and neck which is so desirable in the stallion.

It is the attention to little things which make great successes, so when you open the door to go in or out of the box stall always lock it, either open or shut. If your horse is inside and the door is ajar he may make a break for liberty and be half frightened to death before he gets through the door, or he may put his head out and the door swing shut and he break his neck struggling for freedom. If he is out in the paddock and the door is not locked, open or shut, he may be ruined by trying to go through a door which suddenly clutches him amidships. Round off the corner of the door jamb, inside and out, it may save your horse from being hipped.

Let your stallion have the greatest amount of outdoor life consistent with good judgment.

Don't let there be any perceptible stepdown from the floor of the stall into the paddock, and vice versa.

Have a cross-bar fitted snugly against the bottom of the door outside, and always put it in place at night so that the horse cannot, by a slip, get his foot under the door and thus be ruined. If you use a plank floor, take a 2x4 scantling the length of the stall and nail down parallel with the side wall and

about three feet therefrom, and fill the inclosure thus made with clear white sand to the depth of two inches; in the summer months wet this down daily with salt water, and you will prevent thrush and promote a healthy growth of hoof much like that resulting from a run in a soft pasture. The horse will soon learn to go there and stand. This also serves for a cushion to prevent injurious results to the feet from constant and hard stamping.

To prevent tail rubbing, hock pounding, and to keep your horse from being hopelessly cast, run an inclined plane side wall all around the bottom of the stall, except at the door. Let it start at the bottom eighteen inches in from the side wall and bevel off to meet said wall wherever two 2x14 inch planks will carry it to at the top; brace it up by scantling five feet apart.

If you use a dirt floor, which is not necessary if one uses the moist sand attachment mentioned above, build up a wainscoting to reach eight inches below the cross and let it stand out at least six inches from the side wall. This will prevent tail rubbing, but not hock pounding, nor will it prevent bad results from the horse being cast.

The feed box should be broad and flat so that the food may be spread thinly over it to prevent the ill conditions sure to result in the horse from too hasty eating.

THE Paddock.

The paddock should not be large, for a large paddock gives room for an amount of running and jumping that is apt to produce such injuries as dislocated stifle, slipping of the stifle cap (Patella), hock puffs, bog spavin, and many others; 50 x 100 feet is abundantly large, and 40 x 60 feet will many times be a better size. The fence should be seven feet high, at least, and if the stallion is inclined to break out it may be higher. It should be a tight board fence reaching quite down to the ground, to prevent the animal's feet from slipping under it, and should be nailed from within against stringers and posts that are without, for a horse will sometimes climb upon

the stringers to look over the fence and remain there a long time to the injury of tendons and general conformation.

FOOD.

Feed a stallion according to his form, appetite and condition. Oats and bran are the principal grains to be fed; corn and barley are sometimes fed, but are not desirable as a steady diet. Plain timothy and marsh or prairie hay, fed on the ground or floor, is the best thing in that line; while cornstalks, grass, potatoes, carrots, sweet turnips, and apples are all admissible in small quantities for the purpose of pleasing the appetite and loosening the bowels. Feed salt every day. The process of feeding in detail is something that is highly important and which requires the greatest degree of skill and watchfulness.

To no other part of our general subject can the old proverb, "Eternal vigilance is the price of liberty," be so truly and aptly applied. Study your stallion's droppings every day. Note whether they are frequent enough, whether too dry, or too wet, whether the food is perfectly digested as well as perfectly masticated, and whether they contain worms. If you find them too dry or too infrequently voided, you must correct it by giving less grain, and more bran, bran mashes, roots, carrots, potatoes, turnips, apples or grass, and if the exercise has been too little increase it. If the bowels are too loose feed less hay, less feed of all kinds, and mix half a pint or pint of wheat flour, which has been scorched to a coffee brown, in each feed of oats for a day or two; very little drugging is necessary at any stage of a horse's existence. If you find that the food comes through the horse imperfectly masticated and undigested, look at the animal's teeth and, if wrong, have them fixed. A tooth may be loose, decayed, split, inflamed, too long, too sharp, or what not. It is all important to know that the teeth are shed in season. The horse may bolt his food, and thus produce indigestion and its attendant results. A flat feed box, so broken that the food does not cover it to a greater depth than

one-half or three-quarters of an inch, is a very good form of a box to prevent bolting of the food; another is to put four or five cobble stones as large as an orange into the common-sized feed box, and still another, a device of my own, is made as follows: A square, flat-bottomed feed box, any size you like; a false bottom made of wire with the meshes about an inch and a half in diameter; put in your feed and drop down your wire bottom on top of the feed; press it down to start the feed through the meshes, and the horse will do the rest. Patent boxes with the "feed" regulated, are in market, and are very good.

A horse should be watered either half an hour before meals or two hours after, and during hot weather should have half a pailful midway between meals.

DISEASES.

If his urine becomes thick, and the remedy hereafter given for worms does not correct it, give a teaspoonful of nitrate of potash in his drinking water morning and night for two or three days. If his water is scant or bloody, or if the act of urinating is painful, he must have ten drops of tincture of cantharides in his drinking water three times a day for three days. If the trouble results from a cold give also ten drops of the tincture of aconite in the same way, in addition to the above.

The most common disorders which come to a stallion are, first: Colic, which is most always a result of indigestion. The *remedy par excellence* is: Fluid extract of nux vomica; fluid extract of colocynthis; Fowler's solution of arsenic; of each one ounce; mix. Dose: Ten or fifteen drops in a couple of ounces of *hot water* every fifteen minutes, for three to six doses. Relief will follow in a short time almost certainly. Continue the medicine, one dose after each meal, for three or four days. Injections of hot water, hot as the hand can bear it, and hot applications to the bowels are useful adjuvants in colic. Do not let a horse feed at all for several hours after a spell of indigestion.

The remedy given above is one of the best in the world to prevent and cure (when curable) heaves.

Next in frequency and importance comes worms, and the affections resulting from their presence in the alimentary tract. They are successfully treated by feeding, two or three times a day in the feed, two teaspoonfuls of the following: Powdered areca nut, one pound; powdered copperas, one pound; tartar emetic, three ounces; mix.

For the removal of pin worms make an infusion of Quassia chips, two ounces to a quart of boiling water, simmer for half hour and cool. Inject half a pint or a pint every morning into the rectum. While the worm powder is being fed (and it should be fed thirty to sixty days), a physic should follow a good bran mash about once in ten days: One ounce of good barbadoes aloes in powder, with one drachm of ginger, in a ball is a good physic. The above treatment is a good one for blood disorders, and surfeit, too, only that, in the latter case, less feed and more exercise must obtain, and thirty drops of Fowler's solution of arsenic must be given in his drinking water three times a day for three weeks in addition.

Thrush in the feet is a very common and annoying disease in stallions in stud service. The remedy is to prevent it by constant cleanliness and watchfulness. If any sign of thrush appear, pour into the spaces and cleft of the frog, once a day, a spoonful or two of a six per cent. solution of chloride of zinc. This will cure it, if properly done; as the foot improves use the solution less frequently.

If a horse rubs his tail or mane he is surfeited, has worms, or is lousey. The remedy for the first two is given above, for the latter, apply once a day to the affected surface a mixture of kerosene oil and lard, one teaspoonful of the oil to each ounce of lard.

Influenza, distemper and strangles are, practically speaking, members of the same family, and require pretty much the same treatment. I have had splendid success from the following treatment: At the onset of the disease give ten drops of tincture of aconite in a little water, every two hours, for two days. Then follow with ten drop doses of the following: Iodide

of arsenic, two drachms; fluid extract of bryonia alba, two drachms; alcohol, four ounces; mix. A does of ten to twenty drops in a little water every two or three hours for several days, will surely modify most cases and will abort and cure many times. At such times one of the first things is to open up the bowels with bran mash and a dose of an ounce of pulverized aloes, to which a drachm of ginger has been added, is just the thing.

If the stallion shows signs of becoming impotent, see to it that he does not masturbate, give him plenty of work, attend to his blood, teeth, and general condition, and give the following mixture: Fluid extract nux vomica, twenty drops; fluid extract damiana, two drachms; Merrill's tincture of phosphorous, ten drops. Give this amount in an ounce or two of water, at one dose, three times a day, for two or three months. If not very bad he can have one mare a week; if quite bad, none at all for the season, and only one or two a week the next season.

EXERCISE.

A stallion kept for stud purposes should have regular road work every day. Let him be hardened gradually and then give him from ten to fourteen miles a day, over road or track, or both. Drive him on a walk the first mile out of the barn, then jog and walk alternately the balance of the route; give him no hard speeding, but a little brush, at two-thirds his speed rate, is allowable. Let him sweat a little coming home. After his exercise see to it that he is protected from draughts of cold air, and give no grain for an hour and a half. He may have three or four swallows of water as he comes into the barn, but no more until half an hour before feeding.

GROOMING.

An old dull curry comb, a root brush, and a bristle brush, followed by a flannel cloth, are the things to use in cleaning and polishing his coat; use them in the order in which they are mentioned, and use them liberally every day.

SERVING MARES.

In serving a mare, have her securely hopped, lead the stallion up towards her flank, with his hind quarters a little nearer her head than her tail. When he is ready let him approach her flank, when he will whirl and mount all right. The mare's tail must be bandaged well, for the hairs might easily ruin a stallion's yard by cutting if allowed to be crowded in ahead of the same.

Stallions often come off "proud," that is to say, they do not eject their seed. In such cases see to it that he does not masturbate, and give him more exercise and less feed.

It is easy to detect the passage of the seed during the act by putting the fore finger against the underside of the yard; if a cover has been properly made the impulse throb will be plainly felt. This is a certain and easy test.

If a stallion comes off "proud," lead him away and let him walk around for ten or fifteen minutes and try again.

In teasing a mare compel your stallion to keep within the limits between her hips and shoulders, his nose has no business in front of the shoulders nor behind her coupling. After the horse has covered the mare and is about to dismount, a good groom in charge of the mare will quickly turn the mare a step or two towards the left (towards the stallion groom); this facilitates the dismounting very much.

AMOUNT OF DAILY SERVICE.

No stallion of two years of age should serve more than one mare per week, and ten mares during the season. A stallion of three years may have twenty mares, well scattered, through a three months' season. A four-year-old may serve forty mares, but should not cover but one mare a day. An aged-stallion can take care of a mare every day during a three-months' season, and under pressure may make two covers a day occasionally, but the less of double daily-covers the better.

If a stallion masturbates he must have a shield on

night and day. A good root brush fastened to a surcingle and buckled loosely about the loins makes a cheap and satisfactory shield. There are, however, many shields in the market. I like the all-rubber ones best.

Be very regular and methodical in all your dealings with the stallion. Do not jerk, swear at or excite him.

If you whip at all, do it without anger or loud voice; do it to teach him, not to punish. When you lead him through a gate or door, precede him, otherwise he will soon learn to go in or through with a rush.

Treat your stallion like your younger brother; set him a good example and you'll find him pretty nearly as good a Christian as most people are.

—C. M. BABCOCK, M. D.

SHAKESPEARE'S IDEAL HORSE.

In the beautiful poem of "Venus and Adonis," written about 1590, William Shakespeare thus described his ideal of a perfect horse—the horse of Adonis:

Look, when a painter would surpass the life

In limning out a well-proportion'd steed,
His art with nature's workmanship at strife,

As if the dead the living should exceed;
So did this horse excel a common one
In shape, in courage, color, pace and bone.

Round-hoof'd, short-jointed, fetlocks shag and long,

Broad breast, full eye, small head and nostril wide,
High crest, short ears, straight legs and passing strong.

Thin mane, thick tail, broad buttock, tender hide;
Look, what a horse should have he did not lack,
Save a proud rider on so proud a back.

Sometimes he scuds far off, and there he stares;

Anon he starts at stirring of a feather;
To bid the wind a base he now prepares,

And when he run or fly they know not whether;
For through his mane and tail the high wind sings,
Fanning the hairs, who wave like feather'd wings.

THE BREEDING SEASON.

Not all breeders realize the importance of the events with which the breeding season is attended. An error in judgment at this time may undo the work of years; and the destinies of individuals, families, and races of animals and even fortunes may be determined by a single act. Therefore, it is a season which should be anticipated and planned for as the most crucial period in the breeder's year. Whether horsemen have a band of brood mares or but one, they should give careful thought and attention to the colt crop, present and prospective. It is necessary to arrange, first, for the accommodation of the bred mares while heavy, and with the foals at foot; they then will probably be bred again and there may be others to be mated for the first time, so that the available stallions must be given due consideration.

The natural time for foals to arrive is the spring, and under ordinary conditions, especially in breeding studs, this is customary. However, nature is perverted in many ways by modern methods of domestication, so there are circumstances which make it more desirable to raise fall colts. With good stables, abundance of food and the necessary help, there is no reason why mares should not be made to foal in the fall, if it is more convenient to have them do so. This may be the case with farm mares which are expected to do the season's work in addition to raising a colt. In fact, if one is forced to choose between a spring foal, with no chance to properly favor the mare, and a fall colt which arrives and is suckled while the mare is laid by, the choice of the latter would be more desirable. During the winter, however, both mares and foals will require more attention and should not be "roughed through." But, by late foaling the youngsters can be given a good start before they are set back by the inevitable short pastures and flies of mid-summer.

Of course, breeders of race and show horses take every advantage of the age limit and therefore favor

early foaling. There are also the unquestioned benefits to be derived from the life in the open and the new grass, to commend the spring time for foaling, but prejudice against the late date is not altogether warranted and circumstances may be such as to make it most advantageous.

The feed, work and care at and after foaling are of most importance in connection with the mare. Food and exercise together so regulate the condition of the mare as to determine success or failure in the production of a colt. It is a matter of give and take between them, and the great success follows the practice which maintains a balance between the two. This balance is manifest by the condition which is indicative of the greatest activity of the vital functions, i. e., vigor, expressed in the clear eye, the sleek coat, and the keen appetite which the feeder describes as "heartly," together with a general evidence of nerve and muscle tone. The mare in this condition will carry no superfluous flesh, but is herself sufficiently well nourished to insure ample nutriment for the perfect development of the fœtus or foal. It may be said the ideal conditions for the brood mare, namely, those in which the balance between food and exercise is most easily maintained, and food of the best sort secured, are those surrounding mares at pasture. Fresh air and sunshine, without exposure, freedom to move about at will, with little danger of slips or fatigue, and an abundance of nutritious, succulent forage furnishing the elements essential to growth of the foal and the production of milk by the dam are the things Nature has provided at the season of the year when most females naturally bring forth their young. These can hardly be improved upon, and if they must be modified or substituted for on account of economy, they should still be the standard by which other systems are measured. However, the average farmer must breed his working mares, or work his brood mares. The question which confronts him is how to secure natural conditions for his mares while performing artificial service.

It must be borne in mind that food furnishes en-

ergy and tissue-forming material, and that the performance of work requires energy and uses up tissue. Thus the balance between them is maintained. The mare at work is just as well off in the matter of exercise, fresh air, and sunshine as the one at pasture, but she has imposed upon her labor which demands more energy and uses more tissue-building material. She is also subject to fatigue, mechanical injuries, and nervous disturbances that never come to the mare at pasture.

In general, the management of the brood mare should have for its object the feeding of such a ration as will supply the demand for energy and tissue, and still allow ample nourishment for the development of the foal, either before or after birth, together with such a regulation of the work as will protect the mare from becoming tired, overheated, or injured in any way. She must not be fretted by another horse, nor by a rough hand, while heavy, jerky pulls, extreme speed, rough saddle work, or jumping are to be strictly prohibited. But to work a mare up to within a month of foaling and then confine her in a stall with no exercise whatever, is almost as injurious as to begin working her hard after ten months rest, following breeding. It is not unusual for mares to foal successfully while in the field at work, but it is safer to gradually diminish the work, so that during the last few weeks of pregnancy only the lightest work or exercise in a yard is taken.

It is a peculiar fact, that while the two extremes in condition are both unfavorable to breeding, statistics indicate that the birth rate among nations has shown a marked increase following devastation by war and famine, conditions of life in which the females become reduced to the extreme of low condition. This would seem to be in response to a natural law for the preservation of the race, and need not be taken to indicate that starvation and extremely low conditions are favorable to reproduction. It is true that a thin mare is more apt to breed than a pampered one, but a mare in low condition has no reserve on which to draw for the nourishment and growth of her

colt. Her whole system is in an impoverished condition which must be corrected before the nutrients can be available for the growth of the foal.

The quality of the ration is of as much importance as the quantity. Fat production is to be avoided, and the formation of blood, muscle and bone sought instead. Hence, food stuffs rich in protein and ash, such as oats, bran, clover, and alfalfa are to be preferred to the starchy foods like corn. A useful ration for the brood mare is the following: Ground oats, four parts; wheat middlings, five parts; linseed meal, one part; with clover or alfalfa for roughage if bright and properly cured, and the mare is not at work. For mares at hard work leguminous roughage is not to be commended.

The state of mind of the mare about to foal is worthy of some consideration. Many individuals, especially high bred ones of the hotter blooded breeds, are of an extremely nervous temperament, and it is important to secure for such mares, peace of mind as well as of body. Any change in stalls or attendants, with a view of securing greater convenience at foaling time, should be made early enough to permit the mare to become thoroughly familiar with her surroundings before the critical time arrives. To remove the mare to a strange stall, perhaps even to a strange stable, away from customary stable mates and attendants, but in the presence of strangers, immediately before foaling, is not conducive to that peace of mind so essential at this time. The presence of a male, the use of drastic medicines, surgical operations, and so forth, should be carefully avoided.

The tendency of pregnant females to fatten as pregnancy advances must be guarded, as they may become so fat as to interfere with the development of the foal, cause abortion, or trouble at birth. Just before and after foaling, the ration of the dam should be lightened and made more laxative by the addition of bran, either dry or in a mash, to be continued until both dam and foal have fully recovered from the ordeal through which they have just passed. Exercise should be permitted after the system of the mare has re-adjusted itself, but regular work should not be

begun inside of three weeks. It is better still not to work the mare until the foal is weaned.

It is imperative that the new-born foal get the first milk from the dam. This fore-milk looks thick and yellow, and is sometimes drawn off as unfit for the foal, but such a practice is a common cause of death to the foal two or three days after birth. This colostrum, as the first milk is called, is a natural purgative for the removal of the material which has accumulated in the foal's digestive tract during development. Its prompt removal is essential to the life of the colt. During the existence of the foal as a suckling some especial precautions must be taken in addition to those already mentioned. The milk flow must be maintained by succulent forage, the colt must be fed often and the dam must at no time be in such condition as to render the milk injurious to the foal.

Most breeders advise leaving the colt in the stable while the dam is at work, but others allow the colt to follow the dam to the field. The objection to the former method is that unless the mare is returned at least once during each half day the colt becomes very hungry, and when the mare comes to him sweating, he gorges himself on the milk with which her udder is distended. This milk is often rendered injurious by the heated condition of the mare, and it thus becomes a cause of serious digestive disorders, especially when so much is taken. It is a good thing to encourage the colt as it grows older to take a few oats, preferably ground, from its mother's allowance; or a creep may be constructed especially for the colt to feed in. If two mares and foals are allowed together, the youngsters will form an attachment for each other which will prove of great service in reconciling them to the weaning process.

Observations have shown that a mare may be bred with greater certainty of success on the ninth day after foaling than at any subsequent date. It is also known that mares which have their sexual ardor somewhat suppressed by a moderate degree of fatigue are more apt to conceive than mares in an extremely nervous condition at the time of service. It is for this purpose that the Arab gives his mare a sharp run just prior to service.

N. B. CRITCHFIELD.

CHAPTER II.

CARE AND MANAGEMENT OF BROOD MARES.

As this article does not treat of the selection of the brood mare, it is to be supposed that we have an animal sound in every way, and free from all defects and diseases that are liable to be transmitted. Nearly all diseases which equine flesh is heir to are hereditary, or the constitution or conformation likely to contract disease is transmitted, and, consequently, the greatest care should be taken to ascertain that the mare be sound in every respect. The importance of giving a mare proper care cannot be underestimated, for in proportion as we are successful with our mares will our breeding ventures prove profitable.

The breeders of the trotting horse in America are divided into three classes: the city breeder, who breeds one or two mares, and who, having no farm, keeps them in the city; the small farmer, who breeds trotters on the side, so to speak, and the large breeder of unlimited means and facilities; all requiring more or less different care and management for their mares. The limits of this article not admitting of a detailed treatment of each class, the subject must be handled in a general way, leaving the astute breeder to make his own deductions as to what will suit his particular case.

GETTING MARES IN FOAL.

In the first place the all-important thing is to get your mare in foal, and right here I would say that a mare should not be bred before her three-year-old form, my plan being to endeavor as much as possible to have the yearling filly develop as much in bone and stature as possible, and then train her in her two-

year-old form, getting a record if possible, but avoid over-taxing her. It may happen that you have a phenomenal, in which case you will do well to defer her breeding until she has made a reputation on the turf, thereby adding greatly to her own value as well as to that of her produce. Adopting this course, then, we have as a three-year-old a fully developed and almost matured animal. I would not breed her before March 1, in northern climates, as I find that previous to that time mares almost invariably fail to catch. My plan is to try the mare three times a week until we catch her in the season, and when served to place her in a quiet place alone for a few hours. It is the general method not to return the mare again until the twenty-first day, but I have found it a good plan to return her at the fourteenth, eighteenth, twenty-first, twenty-fourth and twenty-eighth days, as I find that mares are just as apt to come in season on any of the dates named as on the twenty-first. If she refuses the horse on each of these occasions I try her three times a week thereafter for two weeks, and if, at the end of that time she still refuses, then twice a week for two months, and if at the end of that time she still refuses, she may be considered safely in foal. My reason for being so thorough in this respect is that the liability of failing to get the mare in foal will be lessened. A valuable mare bred to a high-priced horse, and failing to get in foal, loses not only what might have been a valuable colt, but suffers a loss which is irreparable, for that year of her life, as a breeder, has been lost irretrievably. It behooves us then to use every precaution in order to insure her fertility.

CARE DURING PREGNANCY.

Now as to her care during pregnancy. A mare in pasture will receive all the nourishment she requires, and will take all the exercise she needs, but if you are mindful, however, to feed her a little grain it will only do her good, as she will relish the change, and all good grains being blood producers, it will be of benefit to the growing foetus. That a mare in foal

can be worked is not only true, but I believe, if the proper care is taken, it is beneficial. Many are the instances where a mare in foal has fought out hard races and gained a low mark in the early stages of her pregnancy, and the experiment has been fraught with nothing but good to both mare and colt. The greatest care should, however, be exercised to avoid all slips or unnatural strains, as such generally result in painful injuries, ending in abortion.

ABORTION.

Kicks, strains, falls and unusual excitement are, of course, the known causes for abortion, but there are many cases which defy the skill of the veterinarian in detecting the cause. My experience has been that a mare will abort within twenty-four hours after being attacked with pinkeye, and from post-mortem examinations held on mares which have died out of a herd, a majority of which aborted, I concluded that, though not apparent to outside observation, the mares were suffering from what might be termed bilious influenza. Treatment in such cases I believe to be useless, as the mare will slip her colt despite all efforts. In the cases of those mares that have aborted, when about four months gone in foal, the following year, I find that feeding them wheat and a little hemp seed and black haw is beneficial in preventing them from aborting again.

In the fall, mares in pasture should be taken up before the herbage gets too scant, as it is very essential to keep the mare in good condition, but not fat. Ground oats and bran, with hay and a few carrots will keep them in ordinary flesh and good condition if fed with judgment. They should be allowed to run out during the day, but in no case be exposed to severe weather, and at this time the greatest care should be taken to prevent injuries of any sort. The mare should have a box stall about 12x12, well lighted and ventilated, and which, above all things, should be kept thoroughly clean and well bedded.

FOALING TIME.

As the period of gestation draws to an end, which

lasts all the way from a little more than 300 to a little less than 400 days, and commonly about 340 days, a close watch should be kept on the mare, as it may be necessary to assist nature. The signs of parturition are generally a sinking in about the flanks, just under the hips, and the filling out of the teats. If everything is all right the colt will come without any aid, and in such cases do not interfere, for if mare and colt are all right they will take care of themselves. Should the colt come wrong, that is, not in the natural position, then assistance is necessary. Anyone with a little experience and a little common sense, by means of foaling hooks and other veterinary instruments, can readily assist the mare, and assistance must be prompt, for if the assistance of a veterinarian cannot be secured at short notice, the chances are that, if left in this condition for an hour or two, both mare and foal will be lost. A man cannot be told how to act in such cases, however, as the use of instruments must be learned by practical demonstration. There is one case, however, which occasionally occurs that can be readily remedied by any one, and that is where the colt is foaled in the sac, in which case the colt should at once be liberated, as otherwise it will soon smother.

The attendant should not leave the mare and foal until he is satisfied that neither need further assistance. He must see to it that the foal stands up and a little tepid water should be injected. The mare, if sucks, and if it fails to do either, must be assisted. He should also see that its bowels move and if not, fed hay and grain at time of foaling, is also liable to be constipated, and this should also be attended to. After foaling and when she gets up I give her a warm mash and some chilled water. After all has been attended to, the mare should be left alone with her foal and kept as quietly as possible, the attendant occasionally looking in to see that nothing has gone wrong.

IN SEASON AGAIN.

We will now suppose the mare to have got through all right and nursing her colt. It is the rule that she

will be tried on the ninth day after foaling, but I find many will come in season at the seventh day, and accordingly I try them on that day, and on the eighth, and if not too cross, or fighting the stallion too much, I serve them on the ninth day whether they are in season or not, for if that date is allowed to pass in some cases they get so attached to their colt, and get so cross and ugly that they will not allow the stallion to come near them. In such cases I also try them every day for several days, but if not, I proceed as described in the beginning of this article.

A good deal has been written and said about milk-producing food, but the only true milk-producing food is rich grass, and the sooner the mare can get this the better for herself and colt.

WEANING THE COLT.

I wean the colts at from five to six months old, my method being to have a small paddock alongside of a field in which the mares and colts are, and by means of a fence, built in such a way that the colts can get underneath it but not the mother. In the paddock, or small field, are troughs in which grain is put, and from which the youngsters soon learn to eat. The colts are then taken up and put two in a box stall, and the mares in the meantime fed dry feed, and their udder rubbed with hog's lard or camphorated oil, if necessary, and the operation is complete.

In laying down these rules it must be understood that no fixed regulations can be framed that will apply in all cases, as there will be exceptions and peculiar cases that will undermine all theories or axioms. Above everything else a breeder must have and use common sense.

HENRY LAUGHLIN,
Sup't Uihlein Stock Farm.

PERIODS OF GESTATION.

Breeders will not fail to appreciate the value and convenience of the table printed below. It shows at a glance when a mare is due to foal if bred at a certain date; also when she should be served in order to "come in" at a given time. A mare should carry her foal 340 days:

Time of Service	Due to Foal	Time of Service	Due to Foal	Time of Service	Due to Foal	Time of Service	Due to Foal
Jan. 6	Dec. 11	April 11	Mar. 16	July 10	June 14	Oct. 8	Sept. 12
" 11	" 16	" 16	" 21	" 15	" 19	" 13	" 17
" 16	" 21	" 21	" 29	" 20	" 24	" 18	" 22
" 21	" 26	" 26	" 31	" 25	" 29	" 23	" 27
" 26	" 31	May 1	April 5	" 30	July 4	" 28	Oct. 2
" 31	Jan. 5	" 6	" 10	Aug. 9	" 14	Nov. 2	" 7
Feb. 5	" 10	" 11	" 15	" 14	" 19	" 7	" 12
" 10	" 15	" 16	" 20	" 19	" 24	" 12	" 17
" 15	" 20	" 21	" 25	" 24	" 29	" 17	" 22
" 20	" 25	" 26	" 30	" 29	Aug. 3	" 22	" 27
" 25	" 30	" 31	May 5	Sept. 3	" 8	" 27	Nov. 1
Mar. 7	Feb. 9	June 5	" 10	" 8	" 13	Dec. 7	" 11
" 12	" 14	" 10	" 15	" 13	" 18	" 12	" 16
" 17	" 19	" 15	" 20	" 18	" 23	" 17	" 21
" 22	" 24	" 20	" 25	" 23	" 28	" 22	" 26
" 27	Mar. 1	" 25	" 30	" 28	Sept. 2	" 27	Dec. 1
April 1	" 1	" 30	June 4	Oct. 3	" 7	" 31	" 6
" 6	" 11	July 5	" 9				

ARTIFICIAL IMPREGNATION.

Many breeders in these days consider an artificial impregnator for barren mares and irregular breeders, a necessary part of a breeders equipment. Full particulars on this subject can be had by getting a free copy of the booklet as per the advertisement in the back of this book.



CHAPTER III.

CARE, BREAKING AND DEVELOPING OF COLTS.

It has been truly said that "goods properly bought are half sold." It is equally true that a colt properly bred is more than half developed. Hence, to insure the best possible results in the development of the trotting bred colt, it is quite essential that he be provided with ancestors of that ilk, and the more illustrious performers and producers his pedigree contains the better for all concerned, supplemented always, however, with a subject of individual excellence. Therefore, look well to the individuality, the breeding and performance of his ancestors. When these are satisfactory you may proceed to his development with all assurance of success.

CARE OF THE COLT.

We will assume that all the ante-natal precautions have been carefully taken and the prospective record-breaker makes his advent into the world some fine spring morning. Now, whether the colt be a trotter, bred in the purple, a thoroughbred, draft bred, or a grade, his early education should be essentially the same. When a few hours old, at most but a few days, the colt must be handled and petted until he becomes entirely fearless of the approach of man. This is to be kept up from day to day, or from time to time. At first put a little fine sugar in his mouth, soon he will learn to like it; then teach him to take a small lump of sugar; afterwards teach him to eat pieces of apple and carrots from your hand. Very early give him a name, and teach him to come when called. **Call him by his name.**

EDUCATING THE COLT.

I prefer the term educating to breaking the colt, though it matters little what you call it if properly conducted. However, his education is to be commenced while he is yet very young and unable to offer much resistance, even if he has the disposition to do so. He is now to be taught to submit to control, one of the most vital fundamental principles in his present and future education and usefulness.

Proceed as follows: Place one hand back of his hind quarters and the other under his neck. In this way you can control him. You can compel him to move forward, backward, or to stand. Tell him "go on," then move him forward; then "whoa," and make him stop. Teach him to back. Repeat these lessons often, but always make them short, and always reward him with a lump of sugar, a piece of apple, or something he likes.

Having progressed thus far with his education he may now be taught to lead. Place on his head a light, nicely fitting halter. Take the strap in the left hand, place the right hand back of his hind quarters, as before, draw very tightly on the strap, telling him "go on." With a little practice he will soon yield to the strap.

Since there will be many colts which will not enjoy the advantages of the early education herein described, I will here submit an effectual method for speedily "breaking" them to lead. Often the colt is allowed to run in pasture with his dam, with no attempt to handle him till weaning time, when he will be strong, wild and quite opposed to all restraint, which being the case I will here give you a method of breaking him to lead, or, in fact, any colt of any age, that is worth more than \$100 to anyone who has colts to handle. By this method any colt, young or old, can be taught to lead in a few minutes without danger of hurting him, or of his acquiring any vicious habits. Take a light rope about thirty feet long, or longer, double it in the middle, drop the center, or where it is doubled, over the colt's rump, down a little below where the breeching rests. Slip the hand

back on the double rope, a little back of the withers, and there tie a knot. Now bring the two loose ends of the rope, one on each side of the colt's neck, and through the ring, or chin-strap of the halter. Step in front of the colt, pulling lightly on the ropes, saying: "Come here." The colt will at once step forward, and by proper management, in a very short time be taught to lead anywhere. When first tying him in the stall run the ropes through the stall ring and tie the halter-strap to them, so that if he backs up he will draw up the ropes, and he will learn to stand hitched without pulling on the halter.

FEEDING THE COLT.

From the time the colt is old enough to eat, if running in the pasture with his dam, he should have a box in some place where he can be fed all the oats and bran he will eat. A pen can be arranged in some corner where convenient, and where the colts can walk in and the larger horses can not. By feeding the colt in this way the strain on his dam will not be so great, the colt will grow better and stronger, with scarcely any interruption in his growth at time of weaning.

When weaned two or three colts should be placed in a large, well lighted and well ventilated, comfortable box-stall, with paddock attached, the larger the better, with a door connecting the two. They should have the free run of both in good weather, shutting them up in the box in bad weather and cool nights.

The box is to be kept thoroughly clean and constantly supplied with an abundance of clean, dry bedding.

During the winter the colt must have an abundance and variety of food—good, bright timothy and clover hay, corn fodder, oats, bran, carrots, occasionally some corn, a lump or box of salt where he can get it when he wants it, with free access to water, or frequently watered.

During the summer he should be allowed a daily run to grass, or have it cut for him, with grain and hay.

CARE OF THE COLT'S FEET.

'Too much stress cannot be placed upon the importance of caring for the colt's feet. One of the essential items of his early education is to have his feet handled. From thence on the feet are to be regularly shaped and leveled. About all the implements needed are a foot-hook and rasp. The foot is first to be leveled from the bottom, the heels properly lowered and then the shell at the edges rounded up. The frog should never be cut nor the sole shaved out. The feet should be picked out and examined daily.

BREAKING THE COLT TO DRIVE.

The time has now arrived when the colt is to be broken to harness. If the colt has always been petted as he should be and has no fear of man, there will be but little trouble. If not properly treated there is danger of his becoming sullen or stubborn before he has learned this "new departure," so unlike all that has been previously taught him and required of him. Put a "biting-rig" or single harness on him, with an open bridle, put up the check very loosely and turn him into a small paddock. Scare him a little in some way to make him start up. At the same time say "go on," "get up," or whatever term you choose to use for starting him. Practice in this way for a little while until he learns to start and stop at the proper commands. Then get a light buggy whip, crack it or touch him lightly on the rump when starting him up.

When he thoroughly understands all this and the use of the whip, put the lines on him, running them back through the shaft lugs instead of the terret rings, so he can be prevented from turning around, and thus teach him all about driving, starting, stopping and turning.

"Make haste slowly." Make all his lessons short, and by repetitions impress each point upon his mind. At all times be very kind and considerate, remembering he is perfectly willing to do what is required of him if he understands.

Do not scold him and don't swear at him.

After each short lesson give him a lump of sugar, an apple or carrot, put him in his box and give him a handful of oats. All these little kind attentions preserve and cultivate his confidence and disposition.

While, in many cases, the colt may be hitched up single to the cart without accident, it is always safest and best to drive him several times at first double, with a well broken horse. Afterwards continue his education until he is thoroughly schooled in the art of driving. His lessons should be short and frequent.

DEVELOPING THE TROTTER.

Let it be understood at the outset that there is to be a distinction made between developing speed and preparing him for a race of heats or for a record.

Speed at the trot is now what you desire and what you must have before you can win a race or get a record.

The colt is now thoroughly broken to drive and ready for the first lessons in trotting. These may be given to him on the track, street, or on the road, where smooth or level, though ordinarily I prefer to give the horse all his work on the track, and since this is not the practice of most trainers I may digress from my subject a moment to give my reasons. In the first place, I do not deem it necessary to give most horses more than about half as much work as the average trainer gives them when working them for speed. Hence there is not the danger of the horse becoming "track sick," of which they tell. Again, the track, by reason of special preparation, is much smoother, more level and even, consequently much safer than the roads. After the horse has acquired sufficient speed in his preparation for races perhaps he can be worked to advantage on the road, but I doubt it very much, and have never yet found it necessary. You will sometimes find a colt that will not try to trot or seem to take any interest in trotting on the track, which, when driven on certain streets or on certain places on the road, will square away and show surprising speed. When this is the case use such places for brushing him.

It will sometimes help the colt to trot to place objects, as sacks filled with straw at intervals for a short distance along near the track or road, for say thirty or forty rods; not near enough to the track to cause him to shy or swerve, but where he can see them. Take advantage of anything or circumstance that induces the youngster to square away and trot.

If everything is in readiness to commence the colt's work, hitch him to a light sulky and drive him to the track. Suppose he is a yearling, jog him from a quarter to half a mile; pull him up and let him walk a little distance; start him up on a jog again, and, after going from an eighth to a quarter, commence driving him a little faster, increasing his gait to about half or two-thirds speed for about an eighth; then pull up and let him walk a little farther than before. When he has recovered his breath and has rested from his exertion start him up again, making the brush a little sharper, never more than twenty or thirty rods at first, often less, all to be governed by the circumstances of the case, age, condition, size and strength of the colt.

Speed is acquired by fast and frequent brushes, whereas long ones are not to the purpose, and, as a rule, give the colt only half as much work as you think you should. At first it is better to work the colt round and round the track, and not back and forth on a stretch or turn, as he will, in that case, get into the habit of wanting to stop and turn round.

From two to four miles is usually sufficient work for the yearling, when he can be worked half the time one way of the track and half the other. Have the entire track supplied with eighth poles, carry your timer and keep a record of what the colt is doing.

Work him eighths till he can trot them as fast as you wish before even driving him fast for a quarter, much less a half or a mile, as is sometimes done, to the great detriment of the colt. If he can't trot an eighth fast he surely can't trot a mile fast.

The two-year-old, three-year-old, or, in fact, any green horse should be worked for speed on the same general plan, as he is only a "colt of older growth." His work should be commenced in the same way as

that of the yearling and increased and varied according to the requirements of the subject. By working the colt on this plan he is never distressed, never becomes sore or tired. If at any time he appears to be tiring in the least his work should cease for the time, for when exhaustion begins improvement ceases.

When he has had his work for the day loosen up his check and harness, continue his walking until he is all cooled off, which may be from half a mile to a mile.

Take him to his stall, give him a little water, sponge out his nose, mouth and eyes, and, if necessary, bandage him and put on a blanket; give him a little "refreshment" of some kind, grass, carrots, bran or oats, and let him rest. Never, on any account, take him to his stall reeking and foaming with sweat and let him stand, tied up, while he is vigorously "rubbed out." Possibly this may be necessary in his preparation for races, but never in the development of speed.

When at any time the horse is brought in hot and sweaty, whether during a race, trial or work-out, shower or sponge him off with warm water, scrape this out, wipe him off, cover him up properly and exercise him till dried out and he will never become cross and irritable, as is the case when "rubbed," as is most frequently the practice.

When the requisite amount of speed has been developed for an eighth of a mile gradually increase the distance to a quarter. Hold him to the quarter for some considerable time.

To prepare him to go a mile up start him from the wire slowly, gradually increasing his speed after leaving the half-mile pole if on a mile track, or after making the first round if a half-mile track, and drive him about as fast as he can go from the quarter pole to the wire. This will teach him to finish fast, a very important thing in a race.

When he will go the last quarter fast enough to suit you work him on the first quarter until he will score down to the wire and make the first quarter satisfactorily; go up about to the distance pole, turn him around, drive him the first quarter about as fast as

he can go, jog on around to the half, start him along and make the last quarter as fast as he can. Of course, to do all this will require considerable time, but be patient and allow all the time necessary.

SHAPING THE COLT'S FEET.

Due attention must at all times be given to properly shaping the colt's feet. Most horses trot best with long toes, both before and behind, and the heels should be kept quite low to allow the frog to reach the ground and receive a part of the weight, and thus reduce the concussion. When the heels are low and the toes are long a larger bearing surface is thus also afforded to receive the weight of the horse at each stride, besides giving more elasticity to the limb than when the heels are high and the toes short. Under no circumstances should the frog be trimmed nor the sole whittled out.

SHOEING THE COLT.

Since, eventually, it will become necessary for the colt to carry shoes, it is well to accustom him to their use quite early in his education. The weight of the shoe must be determined by experiment, always giving preference to a shoe as light as will answer the purpose. Ordinarily a plain front shoe, weighing from three to six ounces will answer to begin with, the shape and weight to be determined by subsequent experiment. The hind shoe may weigh from two and one-half to five ounces, made with outside web longer, trailing from half to three-quarters of an inch, and furnished with a rather short, blunt calk. This form of shoe is suggested because most all horses wear the outside of the hind foot faster than the inside, besides, also, twisting the foot when in the act of lifting it from the ground. The inside of the hind foot should also be made a little lower than the outside, or the outside raised by putting a piece of leather between the foot and shoe. This will cause him to "clear" a little better behind and not strike his shins. The front shoe, especially, should be as thin as practicable, in order to allow frog and sole pres-

sure. The action, both before and behind, may be modified by a change in the shoeing. If the action is too high in front, this may be corrected by lowering the heels and lengthening the toes; if too low, by raising the heels and shortening the toes, but this will also shorten the stride, while the other method will lengthen it.

If it is desired to experiment with shorter toes, supposing now the toes are long, it is not necessary to cut them off, but just make a shoe the desired length, nail it on, and leave the toe intact. On the other hand, if the toes are short, the shoes may be made as long as desired and allowed to project in front of the toe.

Finally, first give the foot the proper shape; fit the shoe to the foot, do not trim the frog nor shave out the sole; use small nails; do not file the shell to receive the clinches; do not rasp the shell.

BOOTING THE COLT.

Too much care cannot be exercised in properly protecting the colt from the beginning by the use of light, nicely-fitting boots. It is not safe to wait till the colt has demonstrated by hurting himself what boots he must have. Such a course is liable to be a costly experiment. Such boots as are proven unnecessary can then be left off. Whenever the colt has advanced far enough in his work to begin brushing he should be provided with the following boots, others if he seems to need them: Scalpers, quarter-boots, tendon boots, and shin and ankle boots, with speedy-cut attachment. After working for some time, if it is ascertained that some of these boots are not needed they can be left off.

The perfect trotter is the one that can go without boots, weights, or any other mechanical appliances whatever, but it is not safe to begin that way, as by reason of his striking and hurting himself the colt is liable to acquire bad habits and faulty action, which it may be impossible to ever entirely overcome. Verily "an ounce of prevention is worth a pound of cure."

J. W. MERCER.

CHAPTER IV.

CARE AND MANAGEMENT OF CAMPAIGNERS.

Begin work with your colt as early as convenient, and, in spite of all that is written about tiresome walking and jogging, commence by giving your horse walking exercise. We can only speak in general terms, for the same amount of work of any kind will not do for all horses, but any watchful man that is capable of handling good horses will soon learn what amount is sufficient for the horses under his charge, always being careful not to weary or disgust the horse with his work. On the contrary, have him come in feeling as if he could have done a little more. After he has been walked for several weeks, commence jogging, and jog on the road, if practicable, for nothing is so monotonous to both horse and driver as jogging on the track. It also has a tendency to make horses travel low. There being no obstructions for them to raise their feet over, they are apt to get in the habit of slouching along, stumbling and knuckling over, which I have found road-jogging to correct in a measure, and often entirely overcome.

Your campaigner should be regularly and carefully fed and watered. My idea of feeding is to regulate the feed to the work, feeding less when the horse is getting slow work and increasing the feed with the work. No set rule can be laid down for all horses as regards quantity, for two horses receiving the same work will require to be fed differently, owing to difference in size, constitution and other reasons that I or no one else can explain.

We have now got to a point where we can send him along some, but do not give him a full mile at first or you will probably find your horse next day with

his ankles puffed and walking gingerly when led out. I have seen horses right off pasture speeded a mile, and the driver would wonder what ailed his horse when he found him stocked and feverish, and would probably pronounce him "n. g." which he surely would be if this kind of training was kept up and while on this subject let me say there are more horses knocked out for a season, and some altogether, by speeding them before their legs and feet are seasoned by slow work than lots of people have any idea of. To illustrate, let any man who has not gone out for a walk for as short a space of time as two or three months, cut loose and run 100 or 150 yards as fast as he can, or jump his best eight or ten times, I don't think he would care to repeat it next day. Well, a horse feels just that way, and there is some difference between 150 yards and one mile, and if it is kept up with the horse it is dead sure to "do" him. To resume, then speed your horse short distances at first, and gradually work him up to a mile, and even then do not drive him as fast as he can go unless it be just at the finish. It is not necessary to get all out of a horse there is in him in his work. It is sometimes in his races, but then we are out for blood and glory.

Many a horse has lost races he could have won by being driven to exhaustion in trials, or in his work, which ever you please to call it, one or two days before his race, and the time would be too short to recuperate. (I have seen them get such doses that all time was too short.)

A campaigner should get repeats, and even three or four heats, and more, if necessary, but not until he has been prepared for them by plenty of slow work, for without them he could never stay up in a race of broken heats. What I condemn is driving a horse for all he is worth in his exercise. A campaigner will get all that kind of work in his races that is good for him, and more, too. Let your horse always have a little to go on and he will amply repay you when he is out for the money. Do your hard driving when there is something in sight.

A campaigner should be taught to score well, and a horse with a good head, and the same kind on the driver behind him, with a little practice will soon learn so he can be rated to his driver's wish on coming to the wire; and a good scorer is almost half the fight for if your horse gets rattled or excited in scoring you may be sure the others will keep him scoring till he is more fit to go to the barn than a race, but as the rattle-heads rarely make campaigners we will say no more of them. They are generally a disappointment financially and in all other ways.

If possible work your horse in company. You can condition a horse by working him alone, and you can make some speed, but you can not make a campaigner. Any horse fit for a campaigner has the spirit of rivalry born and bred in him, and his desire to win is as strong as his driver's, and sometimes far stronger, when, if worked alone, it gets monotonous, and in a short time your horse will get disgusted and not try. You must learn to understand your horse's varying moods. No horse feels the same two days in succession, and for that reason you can not prescribe his work for days ahead. Some jog one day and speed the next, or speed twice a week and jog the intervening days, when, probably if they had consulted the horse's feelings, they would have jagged when speeded, and the reverse. There is altogether too much routine work. If you take your horse out with the intention of speeding him and see he is not feeling just right (and they show it very plainly with their actions, if they can not talk) just forego the pleasure of a fast ride and either give him slow work instead or take him back to the barn, for in trying to get speed out of him when he does not feel that way will probably result in a misunderstanding. He will leave his feet on slight provocation, or on none at all, or do a little hopping or something else which you will be sure to lay to his jimmying, and the whip will be brought into play just to let him know who is behind him and that you will have no monkeying, and a general row will ensue that horse nor driver will probably get over for several days, and when brought

out again, even if you have forgotten your little difference of opinion, be sure that the horse has not, and will look for the same kind of a whirl he got when last hitched and act accordingly, when, if he has been taken back with no work or only a slow jog, he will probably come out next time feeling good and both surprise and please you with his performance.

The management of horses in races depends so much on circumstances that it is very hard to lay any plans. You may make up your mind what you are going to do and something may turn up that will upset your calculations—in fact, is almost sure to; but get as good a start as you can and keep your wits about you ever ready to profit by any mistake of your opponent, and don't pump your horse out trying to win at the quarter or half-mile pole, for the money is not there, but at the wire. Personally, my experience in races has been in the saddle, and I know that a horse that is able to cover a mile at a fair rate of speed can be pumped out in half the distance if set going from the jump. If a sensation is what you are after it is all very well to open a big gap at the half, but the gap will be ahead of you oftener than behind you at the wire.

In the stable the horse should have his feed and water regularly, and be kept thoroughly clean and his box the same. His clothing I would make as light as possible, and if he has not been accustomed to any I would not commence it unless it were a light sheet and hood to keep the dust off. I do not believe in coddling them, especially in the west, where the stables are mere sheds, in many instances, and they have to stand more or less roughing it during the campaign season. If pampered at home, when they get where they are to trot or run the change is too great, the result a cold; the horse has to be scratched and can not fill his engagements.

Boots, shoes and weights are necessary evils, and the less of any of them you can possibly get along with the better. Like all else about your campaigner, no two of them require the same, and the nearer you can reduce them to a cipher the better for your horse.

Of course some horses must have them, but what I mean is, don't make them carry a quarter of an ounce more than necessary, which can only be told by experience, and everyone has to figure that out for himself.

In the care of your horse after a race I believe in leaving nothing undone to properly cool him out and make him comfortable, for no man can have the faintest idea what a horse undergoes to win a hard race, unless it is an athlete who has undergone something similar and he is not urged to his utmost with a whip and can give up and quit when beaten or done up. So he should be blanketed, bandaged, rubbed and walked—yes, and even scraped—and care taken that he does not cool out too fast or catch cold, and should not be left until thoroughly cool and done up if it takes all night.

—J. J. KELLY.

FEED FOR DRIVING HORSES

Timothy hay, oats and bran are the safest feeds for road horses. Alfalfa and clover hay are too washy, while corn does not put the necessary mettle into the drivers. Equal parts by weight of cracked corn, crushed oats and wheat bran is an ideal ration for hard-worked roadsters, and will keep them in flesh and spirit. If timothy and alfalfa hay are mixed, two parts of timothy to one of alfalfa, more corn and less hay can be fed. The alfalfa selected should be from the first cutting, and well ripened, rather than of the leafy kind resulting from the last cuttings and so much desired by dairymen. The hay for a driving or saddle horse should all be given at night, when the animal's day's work is finished, for it is taxing to put a driving horse on the road with his stomach full of hay. It takes him about half a day to strike his easy gait under such a system of feeding. Watering when the horse is warm must be avoided, although a reasonable amount of water taken slowly at broken intervals is not injurious, unless the charge is steaming hot. Chills from standing in drafts or in the open without blankets or protection greatly taxes the endurance of tired or irregularly used driving horses.

CHAPTER V.

DISEASES OF HORSES.

A short description of the principal diseases to which horses are subject has been prepared by the Illinois Department of Agriculture as follows:

EXTERNAL OPHTHALMIA.

External ophthalmia is an inflammation of the eyeball, which may be due to an injury, or a blow, or a foreign body in the eye.

Symptoms.—The eye is kept half closed, as it cannot tolerate the light, and there is a copious flow of tears. The eyelids are more or less swollen, and upon bringing the internal surface to view, one finds them very much reddened and inflamed, and the white of the eye is covered with a network of fine red vessels. The eyeball is found retracted as far as possible, the pupil is widely dilated and very sensitive to light. Often a slight irritation will produce external ophthalmia.

The inflammation of the conjunctive may be simply catarrhal, or of a purulent character, followed by a coating of a membranous nature (diphtheria).

PERIODIC OPHTHALMIA—MOONBLINDNESS.

Symptoms.—This disease of the eye is peculiar to horses and mules. The eye is intolerant of light, the eyeball is drawn backward within its socket, and on this account appears smaller than its fellow. The conjunctiva exhibits slight swelling and reddening. The cornea near its outer border exhibits a well marked ring. As the disease advances, the interior of the eye loses its brilliancy and transparency. A purulent exudate in the aqueous humor and the contraction of the pupil hide from view all the internal parts of the eye. The iris may adhere to the crystalline lens. As the disease progresses the eye clears up somewhat and the exudate, before of a brownish hue,

changes to a sort of grayish color, and part of it becomes absorbed.

The symptoms of the disease occur very suddenly, often appearing during the night. In the morning the eye will be found closed. A copious secretion of tears flows down over the cheek. The white of the whole anterior (front) chamber is dim and clouded, the dimness increases rapidly, and in two or three days a yellow spot appears at the bottom of the cavity. Owing to the formation of pus, this may last from seven to twenty days. The recurrence is the characteristic feature of the affection. The attack may vary in severity in different cases, but the repeated attacks in each case grow more severe until total loss of sight ensues. Five to eight attacks commonly result in blindness. Usually after the first attack a bluish ring around the corneal margin may be seen. Both eyes are rarely attacked at the same time; they may become affected alternately; or the second not until the first has become blind.

The cause of periodic ophthalmia is not definitely known. Old writers claim that damp and marshy grounds are the cause, while others believe that extreme heat or cold is apt to produce it. The thought that improperly ventilated or badly lighted stables is the cause cannot be true altogether, for it is found in stables where the best of sanitation exists. It does not seem to be contagious, for it has not been reported to be contracted from one horse by another. But it seems to exist more in one locality than in another. It is believed that heredity exerts a powerful influence in the development of periodic ophthalmia.

STRUCTURE OF THE FOOT.

It is necessary to examine the structure of the foot most carefully, not as an object of curiosity, but on account of the numberless diseases and accidents to which it is subject.

There are the external wall or crust, the sole or slightly concave surfaces forming the bottom or floor of the case, and the triangular central portion of this, called the frog. The front is the toe, the back the

heel, and the intermediate part on each side the quarter.

When examined from the side, the anterior surface should form an angle of about forty-five degrees with the line of the sole, and the upper edge or coronary band should so join the sole as to leave a moderate substance at the heel; for, if too great, the foot does not expand and is liable to disease from that cause; or if too thin and narrow the foot is weak and gives away downward, ending in a convexity of the sole instead of the reverse.

One will observe that the frog and the wall come in contact with the ground at the same time. The pointed bone that is seen lowest in the foot is the coffin bone. It presses down close to the extreme point of the foot.

Between the bones and the horny hoof are the sensitive laminæ, a collection of little red leaves very delicate in structure. The hoof is developed by secretions, which have their rise in the coronary substance and laminæ.

THOROUGH-PIN.

This is the distension of the bursa. It is much the same as windgall and bog spavin. It appears at the upper and back part of the hock. It varies a great deal in size in different cases. Gentle pressure upon the swelling on one side of the limb generally causes it to disappear on that side and to reappear on the other side of the limb, hence the name thorough-pin. It is not often that it causes lameness. It is, however, to be considered as an unsoundness in the horse.

BOG SPAVIN.

This is a smooth, fluctuant tumor situated at the front and on the top of the hock in that part known as the "hollows." Upon pressure it disappears and reappears on the outside and just in front of the hock.

BONE SPAVIN.

This is a diseased condition arising between the cannon bone of the hind leg and the small, flat

cuneiform bone on top of it. The condition is exactly the same as in ringbone, except that the bony growth comes usually in a lump instead of a ring of bone around the joint. This growth varies in size and in rare cases may be absent, this condition being called occult or blind spavin. The lameness arising from a spavin is a very characteristic one, being one of the easiest forms of lameness to diagnose. The horse shows up very lame upon being backed from the stall. In earlier stages he may start off very lame, keeping the heel elevated and not letting the foot back very far. After being driven a short distance he warms up and may go entirely sound. As the case develops, the severity of the lameness increases and the foot is dragged slightly, enough so that the toe is worn off squarely. Occasionally the animal may go sound, apparently, for several weeks.

CURB.

Curb is a bulging backward of the posterior part of the hock. It is due to an injury or a sprain. It presents itself as a small ossification at the lower part of the hock, and can easily be recognized. It often results from violent efforts when first breaking a colt or handling him to be halter broken. When colts are unruly they may slip, and it is not uncommon for them to be injured at the hock-joint at that time. When the hock is injured it presents a swelling with a varying degree of heat and soreness. This is also accompanied with lameness. In the later stages the swelling easily subsides, but the deformity of the hock is more pronounced. The lameness also varies in severity.

RINGBONE.

Ringbone is a term applied to a ring of osseous (bony) material around the pastern joint. The coffin joint may sometimes be affected, but this does not often occur. It may come either on the front or hind leg, but is more often found in front on account of there being more weight there. It starts with a strain of the lateral ligaments which bind the two bones together and the inflammation soon extends

to the articular cartilage covering the ends of the bones, and then to the ends of the bones. Nature, in trying to repair the damage done by the disease, throws out a supply of liquid bony material which is pressed outside of the joint by the weight of the animal and forms in a rough bony growth or ring of bone around the right joint, hence the name "ring-bone." Owing to the extreme sensitiveness of the covering of the bone, this condition gives rise to a very severe form of lameness.

SIDEBONE.

Sidebone (ossification of the lateral cartilages) is a condition commonly met with in heavy horses, in the fore feet; it rarely occurs in the hind feet.

The lateral cartilages are two thin plates of irregular quadrangular form, surrounding the wings of the ospedis (coffin bone), which in virtue of their elasticity, assist the sensitive frog and soft structure of the foot in regaining their natural position after being pressed upward and outward by the weight of the animal. They may be easily felt on the sides of the foot, just above the coronet, as two yielding pads. When these become ossified, they are hard and unyielding as the bone of the foot.

Symptoms.—Are a greater or less enlargement of the back of the coronet and heel, the part feeling unnaturally hard and irregular or lumpy. If recent, there is generally increased heat noticed when carefully examined with the hand; but in old-standing cases there is no increase to be detected. Lameness is not always present, but if the horse is driven on hard ground, he will be more likely to show the effect, by going short or sore, than if he were free from disease.

SPLINT.

Splints consist of a bony growth situated on the inside of the cannon bone, usually between the large and small metacarpal bones and downward to about the lower third of the principal cannon bone. They vary in size, ranging from that of a large walnut to that of a small hazelnut. They seem to be more

serious when located near the knee. They are more numerous in young animals than in older horses. Splints occasionally occur on the outside of the fore-leg, but this is very rare. A splint is an enlargement due to inflammation of the periosteum. It may also be due to external injuries, for these parts are naturally much exposed to blows, collisions, and concussions. It is said by breeders that some animals have a predisposition to splints, such as a weak and badly proportioned cannon bone, which is, as a rule, too long. Splint is of very common occurrence in horses. I doubt whether more than a small per cent of horses in the large cities are free from the same. In the large per cent of cases splints do not necessarily make the animal lame, but they are an eye-sore and will reduce the price of the animal. In the early stages the parts are hot to the touch, due to inflammation of the periosteum. Later the inflammation subsides and the entire growth becomes bony.

WINDGALLS. -

Windgall is a name given to dilated bursa. It is a puffy tumor found on the fetlock joint of the hind limb. This is a dropsical condition of the bursa and the tendon which slides behind the same. As a rule, windgalls are not productive of any harm. Occasionally one may be found to be hard and hot and sensitive to the touch. The animal may also be lame at the time. Windgalls, as they ordinarily appear, give away readily to pressure. They may be attributed to external causes, such as severe labor, strains, and the results of severe driving and heavy pulling. Whenever windgalls are hard, they are likely to produce bad results. A great deal of pain is experienced by these enlarged growths. It is said that a certain conformation of the limb favors the occurrence of these tumors.

CONTRACTION OF TENDONS.

This is a shortening of the tendon and causes the limb to bow more or less in proportion to the amount of contraction that has taken place. This occurs only

when the tendon has been injured by blows, cuts and the like.

Symptoms.—Are very easily recognized. If one case has been observed it is not difficult to recognize another. When the tendon is shortened it causes the animal to stand or walk on the toe, and the limb has a decidedly bowed appearance and the fetlock knuckles over. The appearance of an animal while standing or in motion seems uncertain and there is a great liability to stumble.

CAPPED ELBOW.

Capped elbow, more commonly known as shoe boil, is an enlargement of the olecranon and is supposed to be due to injury. This enlargement is quite common among horses and is found under nearly all conditions. The tumor varies in size and in character.

Cause.—It is supposed by the majority of writers that this is due to the animal lying down with the shoe pressing against the elbow. This view is not shared by all. Some believe that it is due to the awkwardness of the animal in attempting to lie down, causing an injury to the parts. It is stated by some that tightly fitting harness, especially the bellyband, may produce it. This disease is not very serious, but is rather troublesome and affects the sale of the animal.

Symptoms.—First, a slight elevation of the skin at the point of the elbow is noticed, which gradually becomes enlarged, and then becomes more and more firm. In other instances we may notice that the parts are hot and painful and exhibit considerable inflammatory symptoms, accompanied by slight lameness.

SANDCRACK.

Sandcrack consists of a fissure (crack) in any part of the foot, commencing at the coronet and extending to the bottom of the foot, as a rule. These cracks may exist in any part of the wall and they receive various names according to their situation. Thus a crack in the wall on the front of the hoof is known

as a center crack, while one occurring on the quarter is called a quarter crack. The latter form or variety is the more common. It is generally seen on the inner quarters of the fore feet and on the toes of the hind feet. There is more or less lameness in connection with it from the fact that when the animal is made to move the crack opens and closes, pinching the sensitive structures and causing pain.

QUITTOR.

Quittor is a name given to a fistulous opening at the heels and quarters of the coronet band. It is usually caused by some injury, nail prick, or caulking, or from a bad corn. It is very liable to occur after puncture wounds. Suppuration of the foot from any cause may result in a quittor, on account of the pus not being able to escape, and it may extend in various directions, destroying the tissues in its course.

Symptoms.—The first symptom to attract attention is a well-marked case of lameness. Upon examining the hoof a noticeable swelling of the coronet band is seen. This swelling may later become soft and a discharge of pus takes place, the wound showing no tendency to heal. In many cases the entire coronet band becomes involved, with from six to ten openings, out of which pus issues.

THRUSH.

Thrush is usually the result of an irritation of the sensitive structures of the foot. It is especially found in a fatty condition of the frog, and is characterized by a very offensive discharge from the cleft of the frog.

Causes.—Thrush may be caused by the animals working in filthy places or standing in filthy stables or corrals. Heavy breeds of horses seem to be more affected by this disease. In running horses it is met with to a considerable extent and it is attributed to the immoderate use of cold water, and it is also claimed by some horsemen that excessive tubbing of horses is a cause. The stuffing of horses' feet with material such as cow dung is also charged with this

affection. It seems to be more common in rather warm than in cold weather.

Symptoms.—The most prominent of these is a discharge from the cleft of the frog. This discharge may vary in color from yellow to a real dark chocolate, and is of an exceedingly offensive odor, one that once met with will ever afterwards be recognized. Lameness may accompany the discharge, but as a rule it is wanting. There is, however, a slight tenderness, especially when the parts of the frog come in contact with a hard, rough road. It is then that the animal may be seen to flinch and go lame for a short distance.

GREASE.

This is a skin disease in the region of the heel. It is often preceded by other diseases or it may be the result of an irritation of the parts. The disease is found more in the large cities and is accredited to wet and cold, mud and filth, and to the irritating chemical substances used by street railway companies. It is characterized by quite an offensive discharge from the affected parts, having an oily or greasy appearance but in reality being of a watery nature. It involves the hair follicles and the sebaceous glands. The limbs may become inflamed and swelled to a large extent, which in turn produces lameness. It is considered by some surgeons that this disease is of a contagious nature, but this has not been thoroughly demonstrated. Horses with flat feet are supposed to be more affected than others. The hind limbs are more often affected than the fore limbs and these cases are more difficult to treat.

Causes.—The most common cause of this disease is possibly that the limbs become wet and the parts do not dry out thoroughly. Another cause may be scratches, or cracked heels. Some of the causes of scratches may also produce grease.

Symptoms.—The symptoms are, a swelling of the parts and a slight discharge. The discharge is of an oily nature at first and soon inflames the entire skin. The animals on first coming from the stable seem stiff. If for any reason a case of grease is not taken

care of it may terminate in a very aggravating limb, with excessive swelling, known as elephantiasis.

CRACKED HEELS.

Cracked heels are commonly called scratches. They are due to irritation. Cracked heels are produced in various ways. It is said that too much moisture around the heels and not having them properly dried may produce this disease. In young horses that perspire freely it is thought that the perspiration running down the heels and collecting there, produces an irritation which causes them to crack. Injuries are also charged to this trouble. For instance, an animal while tied to a fence or lariat may get his leg over the rope and the irritation set up by this may terminate in scratches.

Symptoms.—The first symptom to be noticed is a slightly reddened appearance of the heel. If in the fore limbs, the animal may be stiff at first and there may be a discharge from the heel. After driving for some time the stiffness may disappear. This stiffness is noticed to some degree when the hind limbs are affected. The limbs are at times slightly swollen, which may extend from the ankle to the hock.

KNEE SPRUNG.

In this condition the knee is bent forward, due to the contraction of the flexor tendons. This disease may be caused by hard, fast driving on pavements, or by hard work. It is believed that irregular exercise has something to do with it. This disease may also be due to other disease existing in parts below the knee joint, such as sidebone, ringbone, navicular disease, etc. Stablemen assert that this disease is often found in horses that stand in a stall the floor of which slopes backwards.

STRINGHALT.

Stringhalt is manifested by a certain jerking up of one of the hind limbs when the animal is either walking or trotting.

Symptoms.—The symptoms vary. In some they are

more pronounced than in others. They seem, however, to increase in severity with age.

DISLOCATION OF THE PATELLA.

On account of the patella being situated on the outer side and the ligaments attached to the patella and the tibia, it is not uncommon to have sprains of these ligaments, caused either by direct injuries, falls, slips, or blows. This is a very common occurrence among horses, and especially on the ranges, where the young animals may be kicked on the stifle.

BROKEN KNEE.

This is a term applied to animals scarred on the knee-joint. It is manifested by a loss of hair and in some instances may be an open wound similar to that of an open joint. It may be due to an injury, such as falling on a slippery pavement or on some sharp object. As a rule, horses that show one or more scars on the knee-joint are known to be "stumblers," that is, not sure of foot. Usually they are affected with some deformity of the limb, knee or knuckle, or may have been foundered.

ANEURISM.

Aneurism is a tumor produced by dilation of an artery. When all the coats of the artery are dilated and form a paunch, it is then known as a true aneurism. Such dilations are usually due to chronic heart trouble. False aneurisms are formed when an artery is ruptured and only the inner coat remains intact. Aneurisms may be situated internally in the chest, cranial cavity, or abdominal cavity.

HERNIA (RUPTURE):

There are several kinds of hernias. Some of them are more serious than others. A hernia is sometimes called a rupture, and may be defined as a protrusion of the whole or part of an organ through a natural or unnatural opening.

Abdominal Hernia may be reducible, irreducible, or

strangulated. Strangulated hernia is so called because it interferes with the circulatory system.

Inguinal Hernia is the kind most often met with in stallions and young animals. It is an incomplete scrotal hernia. It may not cause any disturbance, and again it may terminate into a strangulated hernia. Whenever stallions show symptoms of colic, they should always be examined for inguinal hernia. It is somewhat difficult to diagnose an inguinal hernia. There are usually very few external symptoms. Castration seems to prevent the occurrence of inguinal hernia, as it causes the inguinal canal to contract, becoming much smaller, and the spermatic cord to retract.

Scrotal Hernias are by far the most common among animals. They often occur soon after birth. This is caused by the dilation of the sheath of the testicle, combined with a relaxation of the tissues surrounding the inguinal ring. This form of hernia may exist for a long time before it causes any disturbance, but as time goes on the imprisoned intestine becomes filled with feces which cannot escape. It is then that it becomes strangulated and the animal shows symptoms of colic.

Intestinal Hernia is a passing of any portion of the bowel through the naval, thus forming a tumor.

Symptoms.—The patient may paw, roll, and throw himself about, presenting symptoms of colic. The pulse is not full as we find it in cases of colic, but is very much increased and the patient may set up on his haunches. The pulse very soon becomes weak, the eyes dim, the limbs cold, and a profuse perspiration spreads over the animal.

NAVICULAR DISEASE.

Navicular disease may be defined as an inflammation set up in the navicular bone, bursa, and flexor tendon. The disease occurs in the fore feet. In most cases the cause may be found due to hard and fast driving on hard roads. Some think that there is a hereditary tendency in certain breeds of horses to this disease on account of their faulty conformation,

the disease being most frequently met with in horses having short, upright pasterns and a pounding action. Allowing an animal to be idle for a few days, feeding him highly in the meantime, then taking him out for a severe ride or drive on a hard road will cause this disease. But it may also depend on injuries to the foot from bad shoeing; bruises from stones or hardened clay; drying and shrinking of the foot from standing idle too long in the stall; impaired nutrition with increased elimination of phosphate from the system; and extension of the disease from the digestive organs as in overfeed of grain; or a drink of cold water when hot and fatigued.

Symptoms.—The animal points the affected foot eight or ten inches in advance of the other with the heel slightly raised, when standing quietly in the stable. This symptom may last for months before lameness is shown. As a rule, the animal nurses the foot more or less, relieving it of weight. In some instances the limb may be extended and the foot held quite a distance in front of the other foot; but these symptoms are not always noticed, and when noticed they by no means constitute absolute proof of the existence of the disease, as an animal perfectly sound will sometimes get in the habit of pointing.

As a rule lameness is the first symptom to attract attention. It may come on suddenly and be severe, or may be gradually developed and be slight. The horse steps short and on the toe, with a great tendency to stumble when first moved from the stable, which lameness may entirely disappear after going a mile or two, and is worse when the horse is cooled off after a long drive.

Another well marked symptom, especially when only one foot is affected, is the greater or less wasting of the muscles of the limb from disuse, but it is especially marked on the breast, above the elbow, and outside the shoulder blade.

This disease is usually referred to as shoulder sweeney. It is very easily confounded with sprain of the tendon, but is easily distinguished by the heat and contraction of the heel and the tenderness of the cen-

ter of the sole and the quarters to strokes of the hammer.

LAMINITIS (FOUNDER).

Laminitis is an inflammation of the sensitive laminae of the feet. Laminitis is also known as "chest founder." It occurs in acute, sub-acute and chronic forms. The causes are numerous, e. g., injuries to the feet, due to accidents, bad shoeing, or concussion; long drives, especially in hot weather, when the temperature changes suddenly; overtaxation, such as heavy pulling or rapid work; overfeeding; administering large quantities of very cold water when the animal is hot and tired. It may also occur after an attack of bronchitis, pneumonia, or influenza, or may result from allowing the animal to stand on a hard floor for a long period.

Symptoms.—The symptoms of laminitis are very plain and the disease can very readily be recognized from a distance, the mere posture of the animal being sufficient. Lameness may suddenly set in or it may manifest itself simply in a little soreness which may rapidly develop into the characteristic symptoms of acute laminitis. In most cases the first symptoms to attract notice are stiffening and stumbling during progression. As a rule the animal persists in standing, and the fever steadily increases and finally becomes so great that one may suspect lung affection. Usually both fore feet are inflamed in the acute stage. Laminitis may start with a chill, after which the temperature rapidly increases to 103 or 105 degrees. It is not uncommon to notice the symptoms of diarrhoea. These complications are found when the animal is in very severe pain and the entire body is bedewed with sweat. Laminitis is the most painful disease to which the horse is subject. That the pain is intense can easily be seen from the position the animal takes when made to move. Upon compelling the animal to work, one will notice that it is done in a peculiar, stiff manner, and the animal persists in falling and stumbling on level ground. When standing still the animal may be seen with his hind feet placed well up under the body and supporting most

of the weight, while the front feet are stretched out in front with only the heels resting upon the ground. The affected limbs are hot to the touch and one may distinctly feel the pulsation of the arteries of the foot. The most important characteristic to be considered in laminitis are (1) severely painful lameness, (2) increased frequency of the pulse, fullness and hardness of the arteries which can be plainly felt on both sides of the fetlock, (3) rapid respiration and dilated nostrils, (4) temperature running from 104 to 105 degrees, (5) the mucous membrane of the nose being of a deep red color, (6) painful, anxious expression on the animals' countenance and the animal often sweat bedewed, and (7) in most cases a diminished appetite.

ROARING.

Roaring is a very serious condition in the horse. It is defined as breathing with a loud and unnatural sound. It is due to a diseased condition of the respiratory tract, and is heard during the act of respiration and at varying distances from the animal in different cases. In the majority of cases it is caused by atrophy and degeneration of the dilator muscles (posterior crico-arytenoid) of the glottis. All of these muscles are freely supplied with nerves and often some of the nerves lose their influence, become paralyzed and undergo fatty degeneration. There are a variety of causes assigned for roaring, common among which are malformation of any of the air passages, obstruction of the nasal cavities (polypi), which will produce these sounds. In a genuine case of roaring the muscles above mentioned are paralyzed and wasted, in consequence of which the laryngeal opening is not properly dilated, and the air rushing in during inspiration, comes in contact with the loosely flapping parts of the larynx and produces the sound known as roaring. Hereditary tendencies to roaring are said to accompany Roman noses and long, thin necks. This class of animals seems more predisposed to it.

Symptoms.—It is only when the animal is excited or during violent exercise that the sound is produced.

There are two kinds of sounds produced, which differ in pitch; when the sound is of high pitch it is called whistling, and when of a low pitch it is called roaring. In most cases it is only during inspiration that the sound is made, but in very bad cases it may also be produced during the act of expiration.

How to Diagnose a Roarer.—A moderate trot will not always suffice to expose a roarer. The best way to detect these cases is to give the animal a sharp gallop up-grade and then stop suddenly close to the examiner, who by immediately placing the ear to the nostrils and larynx of the animal will be able to detect any abnormal sound. This method of examination should be followed in all cases where an animal is suspected of not being sound in wind.

GLANDERS AND FARCY.

Glanders and farcy are the same disease, the latter being commonly used for those forms where the skin and external parts are affected. Glanders is a malignant infectious disease and is caused by the germ *bacillus mallei*. It was discovered by a French and a German scientist. Before the discovery of the germ this disease was not thought to be dangerous by some of the prominent European scientists. It was thought to be caused by bad stables and poor food. It is easily spread from one animal to another. Mild cases may be highly infectious. Its ravages, however, are clearly shown by the presence of sores or ulcers on the Schneiderian membrane in advanced cases.

The bacteria can be killed by freezing, boiling water, or by certain drugs, such as bichloride, kreso, and the like. The germ most frequently enters and infects the lymphatic system. Some animals seem more susceptible to glanders than others. The mule is far more susceptible than the horse. Cattle are not susceptible to glanders. Harnesses, bedding, water troughs, pails and the like, are the most common carriers of infection to the animals.

Incubation.—This period varies greatly. Various authors have given it from five to eleven days; others

say that it is very much longer, and this is especially true when the animal becomes infected naturally.

Symptoms.—The symptoms of glanders and farcy are as follows: We distinguish an acute and a chronic form of glanders, also of farcy. These differ only in the severity of the symptoms and the rapidity with which disease follows. Chronic glanders is the most common form of glanders. It is more often seen in old debilitated animals. The animal may have suffered for months without showing the least well marked symptom, and in this condition may have communicated the disease to as many horses as have come in contact with it. The symptom usually noticed first is the slightly sticky discharge from one or both nostrils. This discharge is thin and colorless and adheres around the nostrils, giving the same a very offensive appearance. Usually the discharge contains a large quantity of albumen. The discharge may be profuse when the animal is being exercised and is not uncommonly streaked with blood. Ulcers may develop on the nasal septum. These ulcers may heal, leaving a white scar. There may be an elevation of temperature reaching 101 degrees to 103 degrees. Another important symptom is the swelling of the intermaxillary glands. These are somewhat hard and adhere to the jaw bone and are not painful. As a rule, these glands do not show any tendency to suppurate. A few may break down and discharge a thin, oily fluid. As a rule, there is a slight cough. The coat becomes dry and staring and feels harsh to the fingers. The appetite is impaired and the animal gradually falls away in flesh. The discharge is not offensive unless the ulcers extend to and affect the turbinated bones, when it becomes highly offensive. An animal may be affected with a mild chronic form and remain in comparatively good flesh and may live for years in this condition without showing any serious symptoms. When raw, ragged ulcers appear on the mucous membrane lining the nostrils of an animal seven years of age or upwards, whose general condition is unthrifty, and which has swellings of the intermaxillary

glands, such an animal should be tested with mallein, or regarded as suspected of glanders.

Acute glanders is the same as chronic form except that the symptoms are very much more severe and the course is more rapid. In the acute form there may be hemorrhages from the nostrils. In the acute form the animals take the disease very much more rapidly. The swellings of the intermaxillary glands are painful and very much extended. The temperature varies from 100 degrees to 107 degrees. Respiration increases and is very short. The discharge from the nose is exceedingly sticky and the accumulation of dust and dirt has a tendency to obstruct the entire opening, causing the animal much distress during breathing.

FARCY.

This is another form of glanders. It is distinguished by the characteristic swellings called farcy buds or buttons and found on the skin and the lymphatic glands. These vary in size from that of a pea to that of a hickory nut. They are found on the inside of the thigh, on the back part of the hock, under the abdomen, on the sides of the neck, on the chest, and also around the head. In acute cases these ulcers break in from twelve to eighteen days and discharge a sticy, yellowish fluid. In the chronic form they usually do not suppurate, being hard and painless.

Symptoms.—As a rule, the first symptoms to attract attention is a swelling of the limbs very much like that in ordinary lymphangitis. The swelling at times is painful. These ulcers when they have bursted have no tendency to heal, as a rule, and should always be regarded with suspicion. The head of the animal may swell and later farcy sores appear on it. These may heal and leave scars only to reappear again.

MALADIE DU COIT (HORSE SYPHILIS).

This is a contagious venereal disease seen in stallions and mares. It is rather chronic in its course and characterized by a discharge from the genital

organs, accompanied by ulcers and later by paralysis. The disease appears within ten days after copulation. There is an irritation, swelling, and a redness of the external organs of generation. In the mare there is a frequent contraction of the vulva, urination, and a watery discharge which later becomes a thick fluid of a whitish, yellowish, or reddish color. Swellings the size of a fifty cent piece may be found on the body and legs. These may disappear and reappear in other places. The affection of the skin leads to the appearance of circular white spots, which may remain dormant or may suppurate. In the later stages the animals become very much emaciated and dull, and may die within a few months or within a year. In stallion that serve only a few mares, there may be at first only a swelling of the sheath, but after a time the process is more rapid. The most serious symptom is paralysis of the hind limbs. Weakness, emaciation, and dullness increase until death. In some cases there is an itching of the skin which leads the animal to gnaw itself, producing extensive sores.



CHAPTER VI.

CARE OF HORSES IN SICKNESS.

The care of horses in sickness is a subject of which a book of this scope can treat of but very lightly, and an attempt will only be made to give some advice as to the more common of ailments to which horseflesh is heir, with their treatment, more especially as the subject has been handled more or less in the chapters which precede this one.

SWOLLEN LEGS.—In the first place a very common trouble and one which is a source of much trouble and inconvenience to horse owners, especially so to dealers, is swollen legs. It is invariably due to one of two extreme conditions. A debilitated or weakened circulation of the blood, or an overfed or plethoric condition of the animal. When a result of the former it is because there is an insufficient force of the heart's action to return the blood from the extremities, and the blood being stagnated in the limbs, its watery portion will escape from the vessels into the surrounding tissues and produce this dropsical swelling. When of this type an impression made upon the swelling with thumb and finger will remain for some little time. When due to the latter condition, the system is overloaded with waste material which, on account of its excessive amount, cannot be absorbed by the Lymphatic Glands and carried out through the organs of excretion. When due to other conditions if the swelling will disappear upon exercising the animals, it will readily yield to rational treatment. From the foregoing conclusions it will be seen that what is needed in either case is a

combination of a heart tonic and some other remedy that will increase the action of the kidneys and other organs of excretion. Exercising and bandaging will reduce the swelling temporarily, but any permanent relief must come from a removal of the cause.

CRIBBING.—Cribbing, otherwise wind-sucking or swallowing air, says the *London Live Stock Journal*, is a vice peculiar to horses alone. It is a vice which may be checked by mechanical appliances, but is rarely entirely eradicated. The removal of the manger and placing the horse's food on the ground will not prevent a determined cribber swallowing air. The sides of the stall he will some times utilize for the same purpose, and some horses will crib on their own body. Others learn to crib without any support at all. It has been clearly proved that what is known as cribbing is not, as we once thought, an act of belching and expelling gas from the stomach, but of swallowing air into it. Horses killed after cribbing have had the gases in their stomachs and intestines subjected to chemical analysis, with the result that pure air has been found. Moreover, other experiments have been made which lead to the same conclusion. An empty bladder inserted in the gullet in a prescribed way is found to be distended with pure air after the act of cribbing. The vice of cribbing in the way it is most usually performed, is destructive to the teeth of the horse, and so interferes with the proper mastication of his food. Swallowing air, however, in any way, frequently results in serious intestinal trouble—indigestion, flatulency, colicky pains and other ailments.

LOSS OF APPETITE may be caused by overwork or too little exercise, fault with the food, faulty general management, soreness about the mouth or disease of the teeth. When refusal to eat is due to continued over-feeding, short rations for a day or two is all that is required. Food that is not eaten within a reasonable time should be promptly removed from the manger and the next feed correspondingly reduced. Give an animal no more than he will eat up clean. It

often happens that food is refused for no apparent reason, the animal at the same time becoming thin and weak. In such cases "condimental" foods are useful, not because of any superior nutritive value, but because they rouse the appetite. The following formula is recommended for the greater number of cases: Ground or crushed oats and corn meal, of each five pounds, oil meal one-fourth of a pound, common table salt two ounces. If the animal seems to need a tonic or is troubled with intestinal worms, mix with each ration as above given, a dessert-spoonful of powdered gentian, and a small teaspoonful of the dried sulphate of iron. If the animal then refuses the ration a little starvation is all that will be required to cause him to take it, the dislike ceasing as soon as the animal has once been persuaded to partake of the mixture.

WORMS.—When a horse takes every opportunity of rubbing the hair off his tail, and is after all not relieved by the operation, or when outward applications have no effect upon it the irritation probably proceeds from small worms in the rectum. Occasionally applications of salt, or salt and quassia will keep these parasites down. Boil two ounces of quassia chips in two quarts of water for half an hour. Strain off the chips and put half an ounce of salt in the liquid. When blood warm gently inject into the rectum. If retained half an hour or more it will give great relief, but if expelled immediately try again next day. This simple remedy may be repeated whenever the worms are seen to be troublesome, and will never do any harm. But don't pour in the salt without weighing or measuring it. Physic will injure the horse without injuring the worms. In Chapter I, see also the reference to this subject.

ABORTION.—For this trouble many remedies are given, all probably more or less efficacious, and nearly every veterinarian has some particular treatment which he considers superior to all others. There can be no doubt that the best method is to use great care in the feeding and handling of the mare from

the very earliest months of pregnancy, and to increase this care and watchfulness as she progresses. A mare cannot safely be given track work for more than four months after breeding, though we have known instances of mares being bred in the spring and making a summer's campaign while carrying a foal. After four months she should be nearly let up, only receiving work enough to afford sufficient exercise. Care should also be used in feeding to avoid giving grain that has become "smutty," or in other words contains ergot, which increases the chances of an abortion. If a mare has lost her foal regularly for two or three years, and it is apprehended that she will again abort, it is advisable to begin about four months previous to foaling to give her twice a day, night and morning, a half-pint of hemp-seed. Continue this until within a week of foaling. Also commence at the same time to give her one ounce of the fluid extract of viburnum prunifolium in her feed night and morning, continuing this for two months. Many experienced stock farm managers recommend the use of wheat as a preventive of abortion, and advise, if a mare begins to strain or show any indications of coming abortion, to give her immediately a handful of whole wheat, care being taken, of course, to have it clean and free from ergot or "smut." If one mare aborts, and others who are in foal are in the neighborhood, they should be kept carefully away from the spot, and all evidences at once removed. Carbolic acid should be sprinkled liberally about the stall or yard, and the mare isolated from the rest for two or three days. These precautions have proven very effective in preventing those epidemics of abortion that sometimes attack large farms, where large numbers of brood mares in foal are in close proximity to each other. See also Chapter II. as to treatment of abortion.

HEAVES.—There are a great many articles upon the market that claim to cure heaves, all of which are more or less effective, depending on the condition of the animal rather than the effectiveness of the drug. The word heaves is broad in its meaning. There are

at least three distinct different pathological reasons that will cause a horse to heave. If it should come from chronic indigestion and dilated stomach it might be helped by removing the cause. If it was a lesion of the pneumogastric nerve, it would be recognized by the profession as incurable; also if it came from dilation of the air vessels of the lungs.

LICE.—There are many remedies that are recommended for the cure of lice on colts. We have found the following a good thing: Corrosive Sublimate 30 grains in a quart of luke warm water, and half pint of alcohol, and bathe the colt all over thoroughly with this solution, especially along the spine from the tail to the head. Keep the colt in a warm place after the application.

ECZEMA.—If you have a horse that is constantly rubbing himself, especially about the hips and on his sides, whose health is good, appetite good, and has no sign of any vermin or anything wrong except his desire to rub himself. This trouble is eczema. Give him seven drams of aloes and two drams of ginger either in a ball or drench. If the weather and stable are warm wash him with soap and water twice a week till well.

CORNS.—If the corns are the result of bad shoeing they are hard to remove, if from a bruise they are more easily treated. We would advise cutting them out and cauterizing the wounds with a hot iron, or treat with strong nitric acid or chemical pure sulphuric acid; have the shoes removed often, and set to remove pressure.

STRANGLES.—The symptoms of this disease are usually lumps under the horse's jaw, extending up as high as his ears and sometimes making him carry his head to one side. The horse should be kept warm and apply hot poultices of linseed meal to the lumps on the jaw. Change them often each day, and when the bunch gets soft and feels sore in the center take a clean knife and open the abscess, and keep up the poulticing until the discharge stops.

CHAPTER VII.

CARE OF THE FEET—BOOTING AND SHOEING.

The oft repeated phrase "no foot, no horse" has so much of truth in it that we cannot refrain from giving a chapter on this important subject, despite the fact that many valuable hints have been given on the subject in the chapters preceding this.

F. J. Berry, a life long horseman, has this to say on the subject:

The proper shoeing of horses is very important. There have been many articles written about blacksmiths tucking horses feet in shoeing, and one would think by the many articles written that blacksmiths are the most ignorant class of people, and not in any way master of the business, and in some cases this may be true as we think there are quite a good many bunglers at the business, but we think this rule does not apply in general. To the contrary we think the average blacksmith who has had many years experience in the shoeing of horses becomes familiar with all the requirements of the shoe in protecting the horse's foot, and should know far more about the subject than many writers setting down to write, or the person who has had no experience whatever but has merely heard it said that blacksmiths ruin horses' feet, starting out by writing several columns advancing their own ideas and a theory of hearsay not that which is based on experience and scientific principles.

We have had many years' experience in raising, training, handling as dealers of all classes of horses and have made it a practice, when having fine horses shod, to go with the horses to the shop and tell the

smith what is wanted, and when the old shoe is removed from the foot see that the crest is pared perfectly level with the sole of the foot, and that the frog is not touched at all, neither the sole in an average case, and that the crest is brought down on a level with the sole and is made perfectly level from toe to heel, and both inside and outside of the hoof the same height. Then see that the shoe is fitted to the foot and as light in weight as the horse can wear and be properly balanced, when the shoe is perfectly level it will lie on the horse's foot perfectly tight on the outside edge and all the way around.

We never allow the hot shoe to lie on the hoof to burn it, but bevel the shoe inside of the nail holes so it will not touch the sole of the foot, thus giving it bearing equally all the way around outside of the nail holes, except the inside quarter at the heel, this we give a light bearing; this in all cases being the thinnest part of the hoof and should be protected as much as possible. If the heel of the shoe should lie hard on the inside quarter of the foot it would very likely bruise the heel and cause corns, which would have ruinous effect upon the horse's foot.

In all cases allow the frog to come down to the ground to take a frog bearing at every step if possible and carry its part of the weight.

As long as a good healthy frog can be kept to do its work in this matter there will be no contracted heels or pinched feet, and as long as the shoe is set with care, as above described, the horse will never have any corns or sore feet.

While watching the smith and giving him our ideas, we have learned from him many things of interest which have proved beneficial to us.

One of the most intelligent smiths we have ever met, and one who comes as near doing a perfect job as a shoer, said to us he had made the horse's foot a study for many years and we believe this agrees with the old maxim that "practice makes perfect."

In all cases keep the horse's feet moist; clay floors or gravel floors in stalls are preferable. Keep the

horse's feet packed at night with oil meal made of half wheat bran mixed with water; let the horse go out in the dewy grass, if possible, if not, and the horse is stabled a good deal where he cannot get the moisture, use swabs on his feet made of felt, dip in water and buckle around the corset joints, thus keeping the hair wet where the horn grows out, making the hoof, when kept moist and soft, grow in a healthy condition.

If the horse is used through the day wash the feet in all cases on coming in and put on the wet swabs over night again.

Now if the horse's feet have been neglected and allowed to dry up, causing the growth of the horn to stop, feet to contract as they always will when not kept moist, in a growthy, healthy condition, and perhaps being badly shod, corns in the feet, thus nearly ruined as you will find this to be the case with the large portion of horses stabled for a number of years, having only ordinary or but little care; or have stood in idleness on dry hard floors until the feet have become dry and hard like flint; in these cases the horse must be shod properly, giving the right bearing, corns must be trimmed out and that portion of the foot eased from the pressure; the feet soaked in cold water one-half hour each day, never using any hot water, as hot water kills the life of the horn, making it harder instead of softening it; for instance, put a piece of horn in hot water, lay it out in the sun, it will become hard and dry, breaking almost as glass. Thus hot water should never be used on a horse's foot, although tepid as has been set in the sun about the temperature of the air, would be preferable. Rain water is much the best as it is soft, having no lime, like the lake or well water, and has much better effect on the foot. A soap poultice can be used with the best result. A half pint of soft soap, or bar soap can be used, to about one quart of water, thickening with wheat bran until just hard enough for a poultice. Stand the horse's foot in the center of a rubrag, place the poultice all around the

hoof at the edge of the hair from an inch to one and a half thick, bring the rubrag up over it, winding outside the rubrag with strips of cloth until secured on the foot and made thick with cloths outside the poultice, keeping the poultice from drying and giving the desired effect of softening the flesh at the edge of the hair causing the hoof to grow. Thus keeping up the treatment of poulticing and soaking until the front feet are about grown with new hoofs.

The horse can be worked every day, if necessary while going through the process, but if not used might improve faster, but the grain or feed must be reduced as fed high upon grain and not working would have a tendency to increase the fever in the feet, therefore it would be as well to take away the grain, and feed with good hay and bran mash occasionally while remaining idle.

This treatment of course is for the front feet, as the hind feet will always take care of themselves and the horse never gets lame from corns or contractions of the hind feet.

All horses should be shod every three or four weeks and the shoe should not be allowed to remain longer without resetting, and cannot without injury to the feet.

Great care should be taken in shoeing speedy horses, to have the horse rightly balanced, to make the action true and even. Horses inclined to be a little double or mixed gaited require more weight upon the front feet; the usual and better way to do this is to balance the horse with toe weights and this must be used according to the judgment of the driver and gradually worked off as the horse becomes more pure gaited. All horses should be made to go as light as possible, and as they make speed it takes less weight to balance them. If a horse is obliged to carry heavy shoes in front and it is desired to reduce them, let the horse wear the shoes until well worn and then replace by new shoes, the weight of the ones taken off, in this way the horse's shoes can be reduced to any weight desired without throwing

the horse out of balance. In all cases where it can be done the front shoe should not weigh more than eight ounces each, and the hind shoe six ounces each, even lighter than this would be better, provided the horse worked right and still proved to be properly balanced. Some horses trot much faster with long toes, while others with about the same kind of a gait, go much better with toes short. All these things are a matter of judgment, and learned through close observation and practice. If a horse has to wear toe weights reduce them as he makes speed and becomes pure gaited until they can be taken entirely off, if possible, as the lighter the horse can go the more speed he will make and the more heats he can go without tiring; this is one of the most essential points in a race-horse, and upon his racing qualities depends his value more than upon his speed.

MR. BONNER'S VIEWS.

Probably no man living has given the question of shoeing and the horse's foot as much study as Robert Bonner, and his views on the subject as given by a New York *Herald* reporter and reprinted below, must be of interest. Said the owner of Maud S. and Sunol:

In the first place, the great secret of successful shoeing is—keep the foot level. A true hoof usually a sound hoof, and this simple rule is universally ignored. Keep the foot level, there is the condensed lore of a hundred veterinary colleges in that sentence.

Now, as to the dreaded navicular disease. No man can tell, or ever will be able to tell, whether a horse has navicular disease or not, unless he dissects the foot. Fully two-thirds of the alleged navicular diseases are merely sufferings caused by improper shoeing. Why, when Dr. Lewis A. Sayre brought his handsome mare, Fanny Miller, to me she had been lame for months. I examined her, drove her to the blacksmith's and had her shoes taken off, her hoof trimmed and the shoes reset. The mare was all right immediately and has never taken a lame step since, yet before that one of the most prominent veter-

inarians in the city advised Dr. Sayre to get rid of her, as he said she would never be well again.

There's another point upon which the veterinary authorities unanimously agree, and upon which they are entirely all wrong.

That's a sweeping statement, isn't it? But it is truth itself.

Prof. Williams, even, the British text book writer, errs with the rest when he says that if you raise the heels of a horse's shoes you raise the animal's ankle and if you raise the toe you depress the ankle. I've proved that it's wrong over and over again. Anyone reading this theory would think it reasonably and apparently correct, but when you get the bones of a horse's leg, from the knee down, and test the theory you will see at once that it is and must be fallacious from the conformation of the horse's bones. Therefore, when you raise the heel you depress the ankle and when you raise the toe you raise the ankle also, all the colleges and gilded faculties in the world notwithstanding.

About spavin? Well, here's my opinion regarding it. It's far too common, and is brought about by the cruel and gross neglect on the part of the people whose duty it is to look after horses. It is absolutely impossible—absolutely impossible—for a horse to throw out a spavin unless he is too long in the toe. The prevention, therefore, is the easiest of matters.

A general misconception is the popular impression that a running or trotting horse lands on the ground flat footed. This should be corrected, for a man should know exactly how the foot works. In both running and trotting, as the foot lands, first the heel strikes the ground, then the toe—two distinct motions, and so wonderfully quick that the foot seems to land flat.

I repeat and emphasize the point—keep the feet level. For instance, strained tendons are most common, and the horse is obliged to limp, the pain is so great, and there can be no pleasure in riding or driving a horse that is suffering at every step he takes.

The most common cause of distress is the fact of one side of the shoe being higher than the other. This strains the sesamoid ligament on the low side. The average veterinarians will bathe and blister for this. The absurdity of this is evident for until the strain is removed from that ligament, all the bathing and blistering in the world won't cure.

Yes, as you say, many people want to know how a saddle horse should be shod. Use a smooth shoe on him, one without calks. Have the foot leveled properly, and do not go at any pace except a walk on paved streets; when on mother earth then it's time enough to extend your steed.

A horse should have its weight evenly suspended, and none of the sole should touch the ground. The foot is elastic and contracts and expands, the frog being especially porous and elastic. Anything that tends to bind the foot is undesirable. The trouble is, very few blacksmiths understand the conformation and structure of the horse's foot, and how can they fit a shoe under such circumstances. He tries to shoe all horses exactly alike and makes no allowances for differences of conformation, which, though of the highest importance, are by him regarded as unworthy of notice.

In the chapter in the handling of colts and the one on training, additional valuable information on this subject will be found.



CHAPTER VIII.

GAITING AND BALANCING.

(Paper read before the members of the Chicago Veterinary Society by O. E. Dyson, M. D. C., Chief Inspector, Bureau of Animal Industry, U. S. Y., Chicago.)

My object in presenting the subject of shoeing, and incidentally that of gaiting and balancing fast trotters, pacers and ordinary road horses, is to remind the members of this association that an important branch of the profession has been neglected to such an extent in the past that the owner of a knee-knocking, forging, interfering or scalping horse seldom appeals to the veterinarian for assistance. Lucrative fees are thereby overlooked, and the horse, perhaps a prize, or at least a serviceable animal, is sacrificed, or even worse, allowed to pass from good hands to a cheap owner, whose only object is to pound so much work out of every horse, regardless of the pain and torture endured. From a humanitarian standpoint the veterinarian should at least have a knowledge of the art of shoeing for the purpose of correcting or overcoming faulty gaits, rather than leaving the animal to the tender mercies of the blacksmith, who, nine times out of ten, is only interested to the extent of the price of shoeing.

The natural gaits of a horse are the walk, trot, pace and gallop. Without attempting to describe the acquired or saddle gaits, the running-walk, fox-trot, single-foot and canter may be referred to as accomplishments and the result of education.

Imperfections in the above-mentioned gaits are due to many natural causes, such as lack of education, faulty conformation or abnormalities and from ac-

quired causes, such as improper temperament, excessive or non-development of certain voluntary muscles involved in the act of locomotion, or they may be due to ignorance of the owner or blacksmith as to the adaptability of the animal and the proper method of shoeing for the purpose intended.

While not posing as an authority on shoeing, I have as the result of my observation and experience during the past twenty years associated a few facts in regard to the development of speed, with the art of horseshoeing, or what might properly be termed the art of shoeing and the phenomena of speed development.

The first principle necessary to observe with the object of having a perfectly gaited horse, is to study the individual and associate such facts as regards conformation and general makeup, with his way of going as ordinarily shod, at a clip which is intended to be utilized. The next step to be considered, and the one which should govern the proper method of shoeing, is the horse's temperament. The horse should always be shod according to the dimensions of his mental caliber.

Shoeing cannot in all instances, however, be made a panacea for correcting faulty gaits of horses. Intelligent biting and driving must not be over looked, especially if the animal is of a high-strung nervous temperament, and in some instances, owing to a lack of mental co-ordination, the desired result cannot be accomplished by either shoeing or biting. Resort must then be made to mechanical means, by use of hobbles.

Bits and checks may also be included among the mechanical means of gaiting and balancing horses, and frequently take the place of considerable weight which would otherwise be necessary to add to or take from the shoe, in order to accomplish the purpose.

A good driver should, through the agency of bit and rein, be able to transmit motor impulses originating in his own brain to the horse. A poor driver, on the other hand, is not only unable to transmit such impulse, but constantly interrupts the natural motor impulses originating in the brain of the horse, thereby

frequently causing a good-gaited horse to become addicted to the habit of inco-ordination, with its attending results. You have all no doubt witnessed the disastrous results of placing a good-gaited horse in a poor driver's hands.

Interfering is probaly the most constant source of annoyance. In front it is usually due to faulty conformation, involving the chest or forequarter. The thoroughbred type may be cited as confirmed interferers, geldings, owing to early castration, being particularly pre-disposed. With this type of a horse interfering is usually due directly to the fact that he is narrow chested, and good action is seldom associated with this type, as a large majority are stiff kneed, owing to a lack of natural muscular development. Contrast the above type with that of a stag or stallion and note the difference in conformation, style and action.

Calf-kneed horses, unless heavy in the chest, with legs set well apart, are apt to be troublesome. The same may be said of horses with straight pasterns. Low headed and sluggish horses might also be placed in this class. Horses that toe out are notorious, and can invariably be placed in the interfering and knee-knocking class, unless they happen to be of a draft horse type, with legs set well apart. Pacers seem to be particularly prone to this malformation, and a pair of knee-boots must accompany every trotter or pacer that possesses a three-minute clip, if he stands toed out. In this connection it may be added that pigeon-toed horses never interfere or hit their knees.

Interfering behind is so common that no class or type of horse can be excepted, as the fault arises from causes too numerous to mention. First of all, narrow, drooping-hipped, low-going trotters are the worst offenders. On the contrary, pacers seldom if ever interfere, except in walking or going slow. Green horses are apt to interfere during the first six months of their city life, as it requires at least a period of that length to overcome such predisposing causes as walking in a narrow furrow during the early spring work on the farm, and later in the season perhaps doing more or less travel over country roads, where

a wide-gaited horse finds it very tiresome to cover a distance of a few miles with one foot in a rut and the other upon a ridge.

In substantiation of the theories expressed regarding the farm horse, it may be said that trotting-bred colts, notwithstanding manifest predisposition owing to conformation, seldom interfere after a season's work at the track, owing entirely to a uniform development of their muscular system, and an intelligent method of shoeing with an object of overcoming such defects, whether natural or acquired.

Knee-knockers may ordinarily be placed in two distinct classes. First the high-going hores that toes out, and second, the low-going narrow-chested trotter or pacer with speed. Beware of the latter, as he will also, in all probability, interfere when going slow.

Forging, scalping and shin-hitting are the direct causes of hitching behind, and can usually be associated with trotters, owing to their inability to properly extend themselves in front. This condition applies particularly to a class of horses with extensor flexor muscles equally developed behind, and comparatively high, full action, straight or otherwise, in contrast to a dwelling, forward movement of the fore feet, complicated by a lateral twisting or turning of the foot, or leg, either in or out, due to nondevelopment of the extensor muscles of the anterior limb. Line-pacers will frequently brush their hind coronet hard enough to cause them to hitch or roll in their efforts to avoid the contact, which seriously interferes with the development of speed.

Horses that carry a high head on account of tender mouths are frequently addicted to the habit of interfering with the coronary band behind, owing to the fact their attention is concentrated on the mouth. Here it is plain to be seen that the reflex motor impulses in excess cause a high free action in front at the expense of their hind action. When proper biting fails in such cases it is often necessary to use a shoe much heavier behind than in front, in order to overcome or counterbalance the reflected motor impulses. On the other hand pullers and luggers are frequently the result of a lack of requisite amount of weight in

the front shoes or an excessive weight in the hind shoes necessary to balance the brain.

Hitting the elbows is due to overdevelopment of the flexor muscles and in order to overcome the fault it has been found necessary to develop the extensors by use of toe-weights. In many instances, however, it will be found necessary to let the heels grow high in order to lessen the tension upon the flexor muscles. This will to some extent retard flexion until momentum has carried the body past the center of gravity or the point where flexion ceases and extension begins. That is, the object should be to intercept the act of flexion before it is completed and hasten the act of extension. In case the offender has long toes it may be necessary to shorten them or to add a small toe-calk to the shoe which in many instances will suffice without the addition of toe-weights.

Anticipating the question, "How is a person to know when the horse is properly gaited and balanced?" I can only answer by saying that it depends entirely upon the judgment of the driver, or the person superintending the shoeing. Mention might be made of a few cardinal points however. For instance, any man, unless he be devoid of sensation, may observe when a horse driven on a level road gives him the sensation of driving on a down grade that horse needs a weight to develop his extension in front. On the other hand, should he seem to be ascending or climbing a grade, the reverse is true, and the remedy would be to lessen the weight in front and increase it behind. You should always be able to drive a well balanced horse without a check, and not experience the sensations mentioned.

The wonderful speed attained by trotters and pacers during the past few years has, without question, been solely due to the development of brain and nerve, of which an inherited trotting or pacing instinct is a result in the progeny of developed sires and dams. In proof of this fact reference might be made to the thoroughbred, whose development by contrast would seem insignificant, and may be accounted for by the fact that the same system of shoeing and training now in vogue was in use twenty years ago, brain and

nerve development having been almost wholly confided to the jockey and trainer and the natural results of heredity.

A normally developed brain and nervous system will invariably reflect the physical condition. On the other hand, the physical condition will reflect an abnormality. Most of the world's records in tests of speed and endurance are held by stallions, by mere force of predominating will power. "Conditioning the brain" should therefor be used in lieu of the familiar term "legging him up," as expressed by horsemen when preparing a horse to carry his speed and go the route.

In shoeing horses to obviate or overcome a faulty conformation or gait it must be remembered that in the beginning of the stride the foot leaves the ground from the point farthest from the median line or center of gravity, and the greatest muscular efforts in flexing the limb from that point are confined to the muscles farthest removed. For example—in a horse that toes out the abductor muscles that assist in the act of flexion are highly developed in comparison with the abductors involved in the act. Consequently the foot, during its elevation, is in such a position as to cause it to describe the arc of a circle during the act of extension, thereby bringing it in contact with the ankle, shin or knee, depending of course upon the height of flexion. The same is true with a pigeon-toed horse, except that the arc of the circle described is that of abduction, consequently there is never any interference with the opposite member. In either case, however, there is apt to be considerable interference with the forward movement of the hind foot or leg while partly extended, and at that time the act of forging, shin biting, scalping or grabbing the quarter occurs with trotters. With pacers only the act of abduction of the forefoot causes any interference with the forward movement of the opposite hind foot, the usual result of which is grabbing the quarter or brushing the hind coronet.

It would be impossible to form set rules for shoeing in order to overcome defects in gait, either natural, owing to conformation, predisposition and tempera-

ment, or acquired as heretofore mentioned. A safe rule to follow, however, is to ascertain the cause and overcome it by mental balance or physical development.

In this connection I have no hesitancy in saying that too much attention has been given to the foot and apparently no notice taken by the average horse owner or blacksmith of the fact that a horse is possessed of a brain, which controls all volutary movements, and that too much emphasis cannot be placed upon the fact that the highest nerve centers have been in the ordinary process of mechanical shoeing, habitually subordinated to inferior, or pedal extremities.

A term which fully expressed my theory of horse shoeing is "Shoe for the purpose of balancing the brain," or in other words, for the purpose of physical development, the establishment and maintenance of perfect co-ordination between the brain and voluntary muscular system involved in the development of a natural or acquired gait, rather than a purely mechanical standpoint. When you have succeeded in doing this you may depend upon the rest of the animal economy to work in unison, and rapid progress can then be made in the development of an ideal road horse or of prospective speed. It might be well however, to mention the use of hobbles as the only successful mechanical means of overcoming inco-ordination of motor impulses in trotters or pacers, when physical and functional development fails. But in proof of the fact that physical and mental development go hand in hand, note the scarcity of hobbled horses today in comparison with a few years ago, when the system of development and training was simply mechanical.

Motor impulses are always the result of stimuli originating by direct or reflex action upon the sensory nerves, and transmitted to the brain for the purpose of elaboration and direction. Thus we find that voluntary muscles to which motor impulses are directed in excess of other muscles, develop accordingly, or according to their use or disuse. As mental and physical development in all instances is directly re-

sponsible for the perfection of the gait of a sound horse, and being directly subject to the will of man, through education, it is plain to be seen that the effect of increasing or diminishing the weight in the shoe, or changing the angle of the foot, and consequently the position of the limb, will be communicated to the brain and transformed into motor impulses, and the desired effect, that of development of the muscles necessary to overcome the original defect, will be accomplished.

The greatest difficulty encountered in shoeing horses for the purpose of gaiting or balancing is to be able to convince the owner that instantaneous results cannot be accomplished. It is impossible to immediately overcome excessive or non-development, either physical or functional, by merely changing the angle of the foot, the weight or the shape of the shoes.

The following are a few of the common points to be observed before attempting to direct the shoeing of a horse to prevent interfering, or to overcome a faulty gait:

First note the general conformation and posture of the feet and legs with reference to their anatomical relations, while standing in a natural position. By standing in front of the animal and drawing an imaginary line from the upper portion of the leg to the point of the toe, any abnormality such as toeing out or in can be readily discerned.

Change your position and note the pastern with reference to its straightness or obliquity. A slight springing or tendency toward being calf kneed may also be noted at this time.

Pick up each foot and carefully note how each shoe has been worn, their approximate weight and length of service, and make a careful inquiry of the driver as regards the horse's disposition and driving qualities. Also observe the kind of bit and check used.

Then have the horse driven over a smooth pavement, directly in front of you for a short distance and returned in the same manner, at a clip ordinarily required or generally utilized. From this position it is easy to note the carriage of the foot or limb during

the progress of the stride. After viewing the horse from this position, both at rest and in motion, step back a few paces, have him driven past you several times in order that you may carefully note the height of flexion and the act of extension, either of which may be the primary cause of interference or faulty gait, and possibly as easily remedied as seen.

During this exercise every movement of the animal must be noted, and especially that of the offending foot or limb, as regards its relation to the rest of the animal economy.

INDIANA'S PROPOSED RINGING LAW.

1—In order to encourage the breeding of, and improvement in, trotting and pacing horses in the State of Indiana, it is hereby made unlawful for any person or persons knowingly to enter, or cause to be entered for competition, or knowingly to compete with any horse, mare, gelding, colt or filly under any other than its true name or out of its proper class for any purse, prize, premium, stake or sweepstakes offered or given by any agricultural or other society, association, person or persons in the State of Indiana, where such prize, purse, premium, stake or sweepstakes is to be decided by a contest of speed.

2—Any person or persons found guilty of a violation of section 1 of this act shall upon conviction thereof be imprisoned in the state's prison for a period of not less than one year or more than three years, or imprisoned in the county jail of the county in which he is convicted for any definite period not less than six months or shall be fined in any sum not less than one hundred dollars nor more than one hundred dollars. The name of any horse, mare, gelding, colt or filly, for the purpose of entry for competition or performance in any contest of speed, shall be the name under which said horse has publicly performed and shall not be changed after once so performed, or having contested for a prize, purse, premium, stake or sweepstakes, except as provided by the code of printed rules of the society or association under which the contest is advertised to be conducted.

THE RULES FOR REGISTRATION.

THE TROTTING STANDARD.

1—The progeny of a registered standard trotting horse and a registered standard trotting mare.

2—A stallion sired by a registered standard trotting horse, provided his dam and grandam were sired by registered standard trotting horses, and he himself has a trotting record of 2:30 and is the sire of three trotters with records of 2:30, from different mares.

3—A mare whose sire is a registered standard trotting horse, and whose dam and grandam were sired by registered standard trotting horses, provided she herself has a trotting record of 2:30 or is the dam of one trotter with a record of 2:30.

4—A mare sired by a registered standard trotting horse, provided she is the dam of two trotters with records of 2:30.

5—A mare sired by a registered standard trotting horse, provided her first, second and third dams are each sired by a registered standard trotting horse.

THE PACING STANDARD.

In order to define what constitutes a standard-bred pacing horse and to establish a BREED of pacers on a more intelligent basis, the following rules are adopted to control admission to registration. When an animal meets the requirements of admission and is duly registered, it shall be accepted as a standard-bred pacing animal.

1—The progeny of a registered standard pacing horse and a registered standard pacing mare.

2—A stallion sired by a registered standard pacing horse, providing his dam and grandam were sired by registered standard pacing horses, and he himself has a pacing record of 2:25, and is the sire of three pacers with records of 2:25, from different mares.

3—A mare whose sire is a registered standard pacing horse and whose dam and grandam were sired by registered standard pacing horses, provided she her-

self has a pacing record of 2:25, or is the dam of one pacer with a record of 2:25.

4—A mare sired by a registered standard pacing horse, provided she is the dam of two pacers with records of 2:25.

5—A mare sired by a registered standard pacing horse, provided her first, second and third dams are each sired by a registered standard pacing horse.

6—The progeny of a registered standard trotting horse out of a registered standard pacing mare, or of a registered standard pacing horse out of a registered standard trotting mare.

CONFORMATION OF THE CHAMPIONS.

If your coming world beater is built along these lines you may or may not have a champion:

	Lou Dillon.	Dan. Patch.
Height at withers	15.0½	15.2¾
Height at coupling	15.0½	15.3½
Length from point of shoulder to swell of quarter	16.1½	15.3
Length of head, from poll to tip of muzzle	25½	26
Length of neck, from poll to notch in verte- brae, at withers	30½	33
Girth at heart	66½	72
Girth at waist	65	74
Length of foreleg; point of elbow to ground	35	38
Length of front cannon; center of knee to center of ankle	11½	12
Circumference of forearm, at swell	18½	19½
Circumference of front cannon, midway be- low knee	7¼	8
Length from point of knee at rear to ground	21½
Length of hind leg; point of stifle to ground	37¾
Length of hind leg; point of hock to ground	22½	25
Length from point of hip to point of hock	35	42½
Circumference of hind cannon	8½
Length from point of stifle to point of hock	23
Width of hips, point to point	25	24¼

HOW TO LAY OUT TRACKS.

In giving these rules they are just for the ordinary home-made track, as for any other a professional's services should be secured.

HALF-MILE.

For a half-mile track draw two parallel lines 600 feet long and 452 feet and 5 inches apart. Half-way between the extreme ends of the two parallel lines drive a stake; then loop a wire around the stake long enough to reach to either side. Then make a true curve with the wire, putting down a stake as often as a fence post is needed. When this operation is finished at both ends of the 600 foot parallel lines, the track is laid out. The inside fence will rest exactly on the line drawn from the fence. The turns should be thrown up an inch, or an inch and an eighth, to the foot. The stretches may be anywhere from forty-five to sixty feet wide.

ONE MILE.

For a mile track, draw a line through an oblong center 400 yards in length, setting a stake at each end. Then draw a line on either side of the first line, exactly parallel with and 417 feet and two inches from it, setting a stake at either end of them. You will then have an oblong square 440 yards long and 834 feet four inches wide. At each end of these three lines set stakes. Now fasten a cord or wire 417 feet and two inches long to the center stake of your parallelogram and describe a half circle, driving stakes as often as you wish to set a fence post. When the circle is made at both ends of your parallelogram you will have two straight sides and two half circles, which, measured three feet from the fence will be exactly a mile. The turn should be thrown up an inch, or an inch and an eighth, to the foot.

KITE TRACK.

This track is simply a track with two one-third mile stretches and a turn of the same length. This track was designed for speed and speed alone, hence the average reader will not be interested in minute details of its construction.

HORSE PAPERS.**Trotting and Pacing.**

- Horse Review, \$2.50 per year—John C. Bauer, Masonic Temple, Chicago, Ill.
- Horseman and Spirit of the Times, \$2.00 per year—D. J. Campau, Morton Bldg., Chicago, Ill.
- Horse World, \$2.00 per year—C. R. Bentley, Buffalo, N. Y.
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The following is a list of all the American Stud Book Associations recognized by the various Stallion Registration Boards:

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Arabian Horse Club of America, H. K. Rush-Brown, Sec'y, 1729 G. St., N. W., Washington, D. C.

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The American Breeders' and Importers' Percheron Registry Co., John A. Forney, Sec'y, Plainfield, O.

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A BARB WIRE DRAG.

"I have used the barb wire harrow on the track and the pastures at my farm for some years," writes a prominent breeder, "and find it about the most useful implement on the place, especially in its work on pastures. Frequently, and at least once a month during the pasture season, I drag my fields both ways with a barb wire drag I make on the place. It thoroughly distributes and pulverizes the droppings, thus preventing the growth of rank grass about them and tends to prevent the pastures from becoming hide bound, and for these purposes I find it far superior to any drag or harrow made. It is also by far the best drag to use in covering grass seed.

"To make it take a 2x4, 16 feet long, and every 2½ inches fasten with staples a strand of barb wire 20 to 24 feet long, and about 4 to 6 feet back from this 2x4 place another one, stapling the wire fast to it. In order to keep the wire from curling up while it is being made tack the free end of each wire to a board laid parallel to the 2x4. When it is finished, turn it over so that the 2x4s will be on top, take away the board the ends are tacked to and let them curl up. Hitch the team quite a distance from it so that the draft will not lift it from the ground, throw a plank across the ends that have curled up, so as to press them into the grass, and it is ready for use.

"It is a wicked thing to have around where there is young stock. I always remove every animal from the field it is being used in, and have a safe place to keep in when not in use. As it is sixteen feet wide it does not take long to cross-drag a forty-acre field. In using it after grass seed sowing, take off the plank used to weight it, and I generally find that dragging the field one way is sufficient. I then put the roller on the field."

HOW TO GROOM A HORSE.

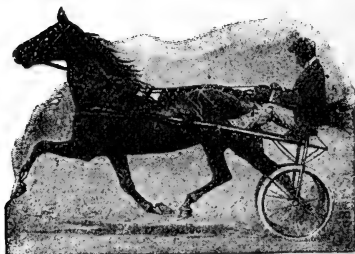
The few stable hands who know how to groom a horse properly, are generally too indolent to do it. It is quite an art to clean a horse as he should be cleaned, and it is no easy job. For that reason he is seldom groomed as he should be. A groom must be active, strong and experienced. Every inch of the horse, beginning at the head, should be gone over thoroughly with brush, comb and rag. A man who would not much rather take care of his own horse, providing he has the time, has not true love for the horse. No animal will repay one for care and attention like the horses. He will show it not only in appearance externally, but in health and spirits. Good grooming will do as much in improving the condition of a horse as an additional four quarts of oats per day.

In grooming a horse properly he should be tied from side to side so that he cannot throw his head around and work himself all over the floor, which he is sure to do under the comb if he is not of a disposition too phlegmatic to feel the scratching. A good brush and comb are required as well as a broom-corn brush for the mane and tail. Never use the comb on the horse's head. If he has any spirit at all he will not endure it. Take the brush in the right hand and the head stall in the left steady his head while brushing gently, and then with the comb in the left hand curry the neck from behind the ear and the entire right side. Go through the same process on the left side; leave no space untouched. After currying take the brush and brush the hair the wrong way, scraping the brush at intervals with the comb to clean it. Then go the right way with the brush; follow the brush with a woolen rag—rubbing the hair up and then smoothing it. Don't spare elbow grease and the horse will show his keep and act as he feels.

KANSAS POOL SELLING LAW.

With the view to prospective legislation the coming winter, I have had some inquiries as to the law on the statute books in states where betting on races is legal, and for the information of all who are interested in favorable legislation along this line the law now in force in the state of Kansas is herewith appended:

"Section 2,396. Bookmaking—That any person who keeps any room, shed, tenement, booth, or building, or any part thereof, or who occupies any place upon any public or private grounds within this state with any book, instrument, or device for the purpose of recording or registering bets or wagers, or selling pools, upon the result of any trial or contest of skill, speed, or power of endurance of man or beast, which is to be made or take place within or beyond the limits of this state, except within the inclosure of a race track and upon races of trials of speed being conducted within said inclosure (provided that the exception herein shall not apply to any race track or inclosure for more than two weeks in any one year), or any person who records or registers bets or wagers, or sells pools upon the result of any trial or contest of skill, speed, or power of endurance of man or beast, which is to be made or take place within or beyond this state, or upon the result of any political nomination, appointment, or election which is to be made or held either within or beyond the limits of this state, or being the owner, lessee, or occupant of any room, shed, tenement, or tent, booth or building, or part thereof, knowingly permits the same to be used or occupied for any of the purposes hereinbefore prohibited, or therein keeps, exhibits, or employs any device or apparatus for the purpose of registering such bets or wagers, or selling pools, as are hereinbefore prohibited, or becomes the custodian or depository for hire or privilege of any money, property, or thing of value which is staked, wagered, or pledged, contrary to the provisions of this act, shall be guilty of a misdemeanor, and on conviction shall be punished by imprisonment in the county jail for a period of one year and by a fine of \$1,000."



TO TELL THE AGE OF ANY HORSE.

To tell the age of any horse,
Inspect the lower jaw, of course;
The six fore teeth the tale will tell
And every fear and doubt dispel.
Two middle "nippers" you behold
Before the colt is two weeks old.
Before eight weeks two more will
come.

Eight months the corners cut the gum.
The outside grooves will disappear
From middle two in just one year;
In two years from the second pair,
In three the "corners," too, are bare.

At two, the middle "nippers" drop;
At three the second pair can't stop;
When four years old the third pair
goes;

At five a full new set he shows.

The black spots will pass from view
At six years from the middle two;
The second pair at seven years;
At eight each spot the "corner" clears.

From the middle "nippers," upper jaw,
At nine the black spots will withdraw;
The second pair at ten are white;
Eleven finds the "corners" light.

As time goes on the horsemen know
That oval teeth three-sided grow;
They longer get, project before
Till twenty, when we know no more.

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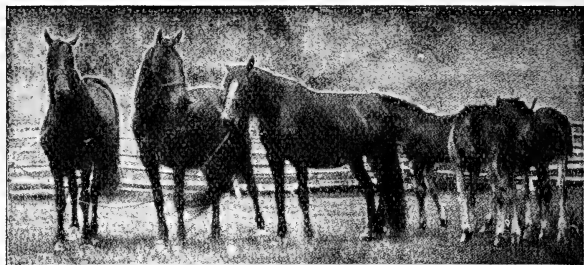
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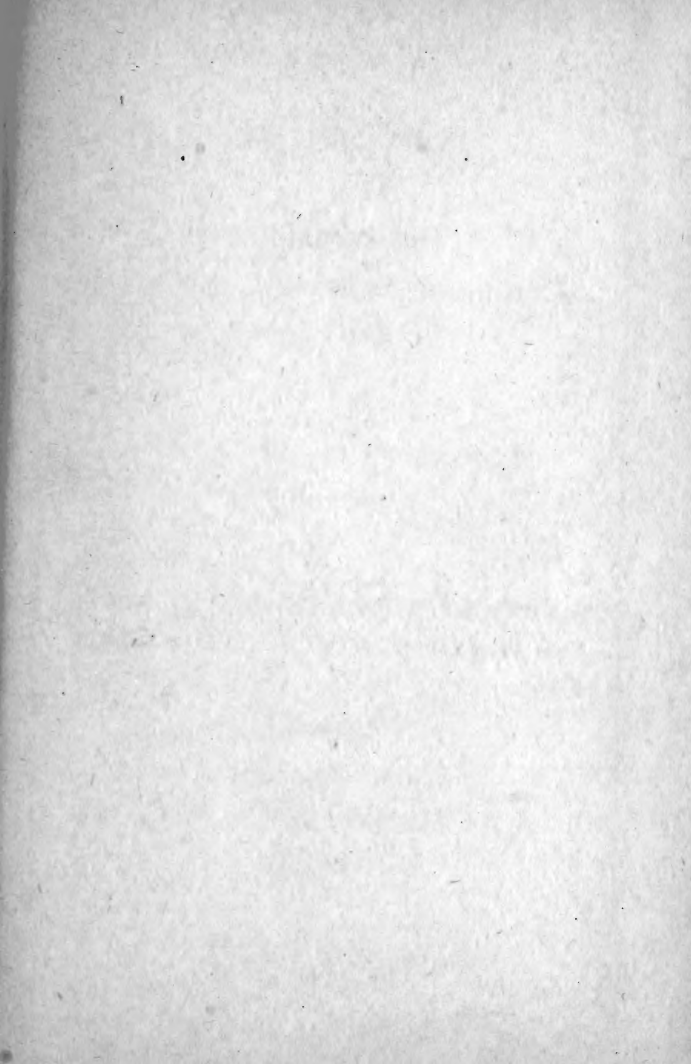
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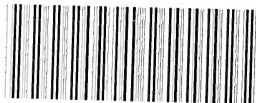




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